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May 10, 2005

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FILE COVERS 1907 - 10 May 2005 VOL 142 ISS 20

FILE LAST UPDATED: 9 May 2005 (20050509/ED)

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L1      12 SEA FILE=REGISTRY ABB=ON  PLU=ON  CCL2F2/MF
L2      11 SEA FILE=REGISTRY ABB=ON  PLU=ON  CH2F2/MF
L3       1 SEA FILE=REGISTRY ABB=ON  PLU=ON  DICHLORODIFLUOROMETHANE/CN
L4       1 SEA FILE=REGISTRY ABB=ON  PLU=ON  DIFLUOROMETHANE/CN
L5      2927 SEA FILE=REGISTRY ABB=ON  PLU=ON  PALLIDUM
L6     219466 SEA FILE=REGISTRY ABB=ON  PLU=ON  ALUMINUM
L7       667 SEA FILE=REGISTRY ABB=ON  PLU=ON  CATALYST
L8      SEL  PLU=ON  L1 1- CHEM :      58 TERMS
L9      SEL  PLU=ON  L3 1- CHEM :      37 TERMS
L10     11323 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8
L11     11314 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L9
L12     11323 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L10 OR L11 OR DICHLORODIFLUORO
METHAN?
L13      SEL  PLU=ON  L2 1- CHEM :      30 TERMS
L14      SEL  PLU=ON  L4 1- CHEM :      11 TERMS
L15     3844 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13
L16     3816 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L14
L17     3971 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L15 OR L16 OR DIFLUOROMETHAN?

L18      519 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L12 AND L17
L19     2374 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L5 OR PALLIDUM?
L20    1176747 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L6 OR ALUMINUM?
L21    1845904 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7 OR CATALYST
L22     127 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L18 AND (L19 OR L20 OR L21)
L23     41 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L18 AND ?HYDRODECHLORIN?
L24     41 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 AND L23

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=> d ibib abs hitstr 124 1-41

L24 ANSWER 1 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:921541 HCAPLUS

DOCUMENT NUMBER: 142:299783

TITLE: Effect of tungsten addition to Pd/ZrO₂ system in the **hydrodechlorination** activity of CCl₂F₂

AUTHOR(S): Murthy, J. Krishna; Shekar, S. Chandra; Kumar, V. Siva; Raju, B. David; Sreedhar, B.; Prasad, P. S. Sai; Rao, P. Kanta; Rao, K. S. Rama; Berry, F. J.; Smart, L. E.

CORPORATE SOURCE: Catalysis Section, Indian Institute of Chemical Technology, Hyderabad, 500007, India

SOURCE: Journal of Molecular Catalysis A: Chemical (2004), 223(1-2), 347-351

CODEN: JMCCF2; ISSN: 1381-1169

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The catalytic activity of Pd on W-ZrO₂ in the **hydrodechlorination** of CCl₂F₂ was studied by varying the WO₃ content. The TPR results of Pd/W-ZrO₂ were related to effects caused by contact with hydrogen. XRD data of spent **catalysts** show that there is no change in the structure of zirconia, indicating that these **catalysts** are highly resistant to the corrosive reaction atmospheric Addition of tungsten to the

Pd/ZrO₂ system led to the formation of CHClF₂ (HCFC-22) in the **hydrodechlorination** of CCl₂F₂. Thus, the role of WO₃ is to catalyze the partial dechlorination of CCl₂F₂.

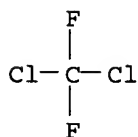
IT 75-71-8, Dichlorodifluoromethane

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(effect of tungsten addition to palladium/zirconia **catalyst** in **hydrodechlorination** of)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-10-5, HFC-32

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(effect of tungsten addition to palladium/zirconia **catalyst** in **hydrodechlorination** of dichlorodifluoromethane to)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 2 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:921539 HCAPLUS
 DOCUMENT NUMBER: 142:318716
 TITLE: Role of hydrotalcite precursors as supports for Pd **catalysts** in **hydrodechlorination** of CCl₂F₂
 AUTHOR(S): Padmasri, A. H.; Venugopal, A.; Kumar, V. Siva; Shashikala, V.; Nagaraja, B. M.; Seetharamulu, P.; Sreedhar, B.; Raju, B. David; Rao, P. Kanta; Rao, K. S. Rama
 CORPORATE SOURCE: Catalysis and Physical Chemistry Division, Indian Institute of Chemical Technology, Hyderabad, Andhra Pradesh, 500007, India
 SOURCE: Journal of Molecular Catalysis A: Chemical (2004), 223(1-2), 329-337
 CODEN: JMCCF2; ISSN: 1381-1169
 PUBLISHER: Elsevier B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB The selective synthesis of CH₂F₂ by **hydrodechlorination** of CCl₂F₂ was studied over calcined Mg-Al and Mg-Cr hydrotalcites (CMA-HT and CMC-HT) supported Pd **catalysts**. The activity of the **catalysts** was compared to that of oxides, MgO, γ -Al₂O₃, and Cr₂O₃ supported Pd **catalysts**. The Pd **catalyst** on Mg-Al HT support has higher stability and selectivity towards CH₂F₂. The **catalyst** followed the order: Pd/CMA-HT > Pd/MgO > Pd/ γ -Al₂O₃ > Pd/Cr₂O₃ > Pd/CMC-HT in terms of selectivity towards CH₂F₂. The Pd/CMC-HT **catalyst** showed deeper hydrogenation activity towards formation of CH₄. The Pd/CMA-HT and Pd/MgO **catalysts** showed higher increase in acidity after the reaction, which stabilizes the Pd sites in electron deficient environments leading to higher selectivity towards CH₂F₂. The lack of sufficient acidity on Pd/CMC explains the poor selectivity to CH₂F₂ observed. XPS results confirm the enrichment of surface fluoride over Pd/CMA-HT and Pd/MgO used **catalysts**.

IT 1344-28-1, Alumina, uses 11137-98-7, Aluminum magnesium oxide

RL: CAT (Catalyst use); USES (Uses)

(hydrotalcite; role of structure of Mg-Al and Mg-Cr hydrotalcite supports for Pd **catalysts** in **hydrodechlorination** of dichlorodifluoromethane to difluoromethane)

RN 1344-28-1 HCAPLUS

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 11137-98-7 HCAPLUS

CN Aluminum magnesium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Mg	x	7439-95-4
Al	x	7429-90-5

IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); PREP (Preparation)

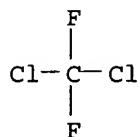
(role of structure of Mg-Al and Mg-Cr hydrotalcite supports for Pd **catalysts** in **hydrodechlorination** of dichlorodifluoromethane to difluoromethane)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-71-8, Dichlorodifluoromethane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (role of structure of Mg-Al and Mg-Cr hydrotalcite supports for Pd
 catalysts in hydrodechlorination of
 dichlorodifluoromethane to difluoromethane)
 RN 75-71-8 HCAPLUS
 CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 3 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:657818 HCAPLUS

TITLE: Hydrodechlorination of CCl₂F₂ using Pd supported on g-Al₂O₃ catalysts

AUTHOR(S): Sridara, Chandra Shekar; Rao, K. S. Rama; Sahle-Demessie, Endalkachew

CORPORATE SOURCE: National Risk Management Research Laboratory, US Environmental Protection Agency, Cincinnati, OH, 45268, USA

SOURCE: Abstracts of Papers, 228th ACS National Meeting, Philadelphia, PA, United States, August 22-26, 2004 (2004), IEC-017. American Chemical Society: Washington, D. C. CODEN: 69FTZ8

DOCUMENT TYPE: Conference; Meeting Abstract

LANGUAGE: English

AB Chlorofluorocarbons, have been implicated in the accelerated depletion of ozone in the Earth's stratosphere. Research groups have been working for effective conversion of the CFCs in to useful compds. Selective hydrodechlorination of CFCs has been identified as a useful process for their transformation as it yields either HCFCs or HFCs that have low or almost zero ozone depletion potential value. Hydrofluorocarbons (HFCs), potential replacements for CFCs that contain no chlorine, have been evaluated for potential effects of fluorine compds. on ozone destruction. Selective hydrodechlorination of CCl₂F₂ (CFC-12) yields CH₂F₂ (HFC-32). In the selective hydrogenolysis of CCl₂F₂, Pd supported on g-Al₂O₃, active carbon, etc were used. In this study, alumina supported palladium catalysts are prepared by wet impregnation technique with varying Pd loading. The catalysts after drying are calcined at 400oC for 4h in hydrogen flow to obtain Pd in poorly dispersed state. These catalysts are tested for their activity and selectivity in the hydrogenolysis of CCl₂F₂ to CH₂F₂. Low dispersed Pd/g-Al₂O₃ catalysts are obtained by H₂ reduction of the catalysts at 400oC. Transmission electron microscope revealed that there is a strong redispersion of palladium is taking place during the reaction. Studies on

the effect of palladium loading on the activity and selectivity in the conversion of CCl_2F_2 to CH_2F_2 and CH_4 have shown that 8wt% Pd on g- Al_2O_3 is optimum in giving maximum CH_2F_2 yields.

L24 ANSWER 4 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:595799 HCAPLUS

DOCUMENT NUMBER: 141:279346

TITLE: Studies on the modifications of Pd/ Al_2O_3 and Pd/C systems to design highly active **catalysts** for **hydrodechlorination** of **CFC-12** to **HFC-32**

AUTHOR(S): Shekhar, S. Chandra; Murthy, J. Krishna; Rao, P. Kanta; Rao, K. S. Rama

CORPORATE SOURCE: Catalysis and Physical Chemistry Division, Indian Institute of Chemical Technology, Hyderabad, 5007, India

SOURCE: Applied Catalysis, A: General (2004), 271(1-2), 95-101
CODEN: ACAGE4; ISSN: 0926-860X

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal; General Review

LANGUAGE: English

AB A review highlighting the various modifications of the support for Pd **catalysts** to enhance the **hydrodechlorination** ability in **hydrodechlorination** of **dichlorodifluoromethane** (**CFC-12**) to synthesize **dichlorodifluoromethane** (**HFC-32**). The supports studied for the modification are either alumina (Al_2O_3) or carbon. In the modification of oxidic support, especially Al_2O_3 , the main objective is to prevent to the maximum extent

the transformation of oxidic support to the corresponding oxy/hydroxy fluorides due to the release of HF during the course of hydrodehalogenation reaction. Modification of Al_2O_3 support has been achieved by covering with carbon, called carbon-covered alumina (CCA), and simultaneous coverage with carbon and fluorine, called fluorinated carbon-covered alumina (FCCA). In the case of carbon as support, even though Pd/C exhibits good conversion in the hydrodehalogenation of CCl_2F_2 , the selectivity towards **HFC-32** is poor, and hence the modification of carbon support is aimed to enhance the selectivity towards **HFC-32**. Modification of carbon support has been achieved by incorporation of either MgO, ZrO_2 , or Al_2O_3 .

IT 1344-28-1, Alumina, uses

RL: CAT (Catalyst use); USES (Uses)

(**catalyst** support and modifier for carbon support; modifications of alumina- and carbon-supported palladium catalytic systems to design highly active **catalysts** for **hydrodechlorination** of dihydrodifluoromethane to **difluoromethane**)

RN 1344-28-1 HCAPLUS

CN Aluminum oxide (Al_2O_3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

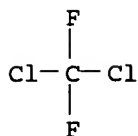
IT 75-71-8, CFC 12

RL: RCT (Reactant); RACT (Reactant or reagent)

(modifications of alumina- and carbon-supported palladium catalytic systems to design highly active **catalysts** for **hydrodechlorination** of dihydrodifluoromethane to **HFC-32**)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (modifications of alumina- and carbon-supported palladium catalytic systems to design highly active **catalysts** for **hydrodechlorination** of dihydrodifluoromethane to **difluoromethane**)
 RN 7440-44-0 HCAPLUS
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 75-10-5, HFC 32
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (modifications of alumina- and carbon-supported palladium catalytic systems to design highly active **catalysts** for **hydrodechlorination** of dihydrodifluoromethane to **difluoromethane**)
 RN 75-10-5 HCAPLUS
 CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 46 THERE ARE 46 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 5 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 2004:315867 HCAPLUS
 DOCUMENT NUMBER: 141:90860
 TITLE: Selective **hydrodechlorination** of **dichlorodifluoromethane** over supported palladium phthalocyanine **catalysts**
 AUTHOR(S): Cao, Yucai; Li, Jianlong; Jiang, Xuanzhen
 CORPORATE SOURCE: Shanghai Research Institute of Chemical Industry, Shanghai, 200062, Peop. Rep. China
 SOURCE: Huagong Xuebao (Chinese Edition) (2004), 55(3), 373-378
 CODEN: HUKHAI; ISSN: 0438-1157
 PUBLISHER: Huaxue Gongye Chubanshe, Huagong Xuebao Bianjibu
 DOCUMENT TYPE: Journal
 LANGUAGE: Chinese
 OTHER SOURCE(S): CASREACT 141:90860
 AB Supported palladium phthalocyanine was found to be an interesting **catalyst** with good catalytic stability for selective conversion of CCl_2F_2 into CH_2F_2 . Particularly, supported palladium phthalocyanine exhibited excellent stability even at low $\text{H}_2/\text{CCl}_2\text{F}_2$ ratio in the corrosive reaction conditions due to the formation of HCl and HF. Relatively high selectivities towards CH_2F_2 formation (>75%) over palladium phthalocyanine **catalysts** with fluoride supports were achieved. The fractionally

reduced palladium in palladium phthalocyanine was suggested to be the main active site for catalytic **hydrodechlorination**.

IT 1344-28-1, Alumina, uses 7440-44-0, Carbon, uses 7784-18-1, **Aluminum** fluoride

RL: CAT (Catalyst use); USES (Uses)

(selective **hydrodechlorination** of

dichlorodifluoromethane over supported palladium phthalocyanine **catalysts**)

RN 1344-28-1 HCAPLUS

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

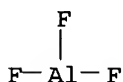
RN 7440-44-0 HCAPLUS

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

RN 7784-18-1 HCAPLUS

CN Aluminum fluoride (AlF₃) (9CI) (CA INDEX NAME)



IT 75-10-5P, **Difluoromethane**

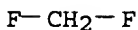
RL: IMF (Industrial manufacture); PREP (Preparation)

(selective **hydrodechlorination** of

dichlorodifluoromethane over supported palladium phthalocyanine **catalysts**)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-71-8, **Dichlorodifluoromethane**

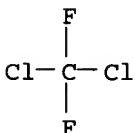
RL: RCT (Reactant); RACT (Reactant or reagent)

(selective **hydrodechlorination** of

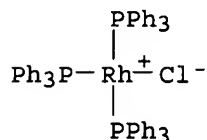
dichlorodifluoromethane over supported palladium phthalocyanine **catalysts**)

RN 75-71-8 HCAPLUS

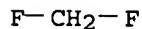
CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



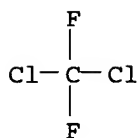
TITLE: Homogeneous catalytic **hydrodechlorination** of CFC and HCFC compounds
AUTHOR(S): Sisak, Attila; Simon, Otto Balazs; Nyiri, Karoly
CORPORATE SOURCE: Research Group for Petrochemistry, Hungarian Academy of Sciences, Veszprem, H-8201, Hung.
SOURCE: Journal of Molecular Catalysis A: Chemical (2004), 213(2), 163-168
 CODEN: JMCCF2; ISSN: 1381-1169
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 141:107887
AB Rhodium and palladium complexes proved to be effective **catalysts** in **hydrodechlorination** of CFC and HCFC compds. in homogeneous phase. $\text{RhCl}_3(\text{py})_3$ and in situ generated $\text{Pd}(\text{P}i\text{Pr}_3)_3$ surpassed $\text{Pd}/\text{Al}_2\text{O}_3$, the most active heterogeneous **catalyst** tested in the transformation of CF_3CHFCl to $\text{CF}_3\text{CH}_2\text{F}$. In the case of CF_2Cl_2 , the activity and selectivity of Rh- and Pd-containing systems depended strongly on the additives.
IT 1344-28-1, Alumina, uses 14694-95-2, Tris(triphenylphosphine)rhodium chloride
 RL: CAT (Catalyst use); USES (Uses)
 (homogeneous palladium- and rhodium-based **catalyst** systems for **hydrodechlorination** of chlorofluorocarbons and hydrochlorofluorocarbons)
RN 1344-28-1 HCAPLUS
CN Aluminum oxide (Al_2O_3) (8CI, 9CI) (CA INDEX NAME)
 *** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 14694-95-2 HCAPLUS
CN Rhodium, chlorotris(triphenylphosphine)-, (SP-4-2)- (9CI) (CA INDEX NAME)



IT 75-10-5, Difluoromethane 75-71-8, **Dichlorodifluoromethane**
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (homogeneous palladium- and rhodium-based **catalyst** systems for **hydrodechlorination** of chlorofluorocarbons and hydrochlorofluorocarbons)
RN 75-10-5 HCAPLUS
CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



RN 75-71-8 HCAPLUS
CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (support; homogeneous palladium- and rhodium-based **catalyst**
 systems for **hydrodechlorination** of chlorofluorocarbons and
 hydrochlorofluorocarbons)
 RN 7440-44-0 HCAPLUS
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

REFERENCE COUNT: 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 7 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:149518 HCAPLUS

DOCUMENT NUMBER: 140:392627

TITLE: Advantages of FCCA and Bi promotion in Bi-Pd/FCCA
catalysts for the **hydrodechlorination**
 of CCl₂F₂

AUTHOR(S): Murthy, J. Krishna; Shekar, S. Chandra; Rao, K. S.
 Rama; Kishan, G.; Niemantsverdriet, J. W.

CORPORATE SOURCE: Catalysis Section, Indian Institute of Chemical
 Technology, Hyderabad, 500 007, India

SOURCE: Applied Catalysis, A: General (2004), 259(2), 169-178
 CODEN: ACAGE4; ISSN: 0926-860X

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The incorporation of bismuth in fluorinated carbon covered alumina (FCCA)
 supported Pd **catalysts** has shown to increase significantly the
 catalytic activity in the **hydrodechlorination** of CCl₂F₂ and
 CH₂F₂ selectivity. During the preparation of FCCA, the formation of
 α -AlF₃ and carbon coverage on alumina has helped in creating the
 extra acidity and in minimizing the support active component interaction
 resp. XRD data shown the formation of interacted species, BiPd₃ between
 Pd and Bi. XPS anal. shows that in Pd/FCCA spent **catalyst**, Pd
 is transformed into Pd halides whereas in the Bi-Pd/FCCA spent
catalysts Pd maintains its metallic state even in presence of
 corrosive reaction atmospheric Bi-promoted **catalysts** exhibited higher
 selectivity towards CH₂F₂ at Bi/Pd=0.5 and good thermal stability in the
hydrodechlorination of CCl₂F₂.

IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); PREP (Preparation)

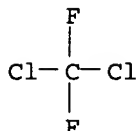
(Bi promotion of fluorinated carbon covered alumina supported Pd
catalysts for CCl₂F₂ **hydrodechlorination**)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

IT 75-71-8, Dichlorodifluoromethane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (Bi promotion of fluorinated carbon covered alumina supported Pd
catalysts for CCl₂F₂ hydrodechlorination)
 RN 75-71-8 HCAPLUS
 CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 1344-28-1D, Alumina, fluorinated carbon covered alumina
 RL: CAT (Catalyst use); USES (Uses)
 (support; Bi promotion of fluorinated carbon covered alumina supported
 Pd **catalysts for CCl₂F₂ hydrodechlorination**)
 RN 1344-28-1 HCAPLUS
 CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

REFERENCE COUNT: 50 THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 8 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:137905 HCAPLUS

DOCUMENT NUMBER: 140:425199

TITLE: Promotional effect of magnesia addition to active
 carbon supported Pd **catalyst** on the
 characteristics and **hydrodechlorination**
 activity of CCl₂F₂

AUTHOR(S): Murthy, J. Krishna; Shekar, S. Chandra; Padmasri, A.
 H.; Venugopal, A.; Kumar, V. Siva; Nagaraja, B. M.;
 Shashikala, V.; Raju, B. David; Rao, P. Kanta; Rao, K.
 S. Rama

CORPORATE SOURCE: Catalysis and Physical Chemistry Division, Indian
 Institute of Chemical Technology, Hyderabad, 500 007,
 India

SOURCE: Catalysis Communications (2004), 5(3), 161-167
 CODEN: CCAOAC; ISSN: 1566-7367

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Magnesia modified active carbon supported palladium (Pd-MgO/C)
catalyst prepared by co-impregnation, has shown superior activity in
 the **hydrodechlorination** of CCl₂F₂ to produce CH₂F₂ in greater
 yields compared to Pd/C and Pd/MgO **catalysts**. The high activity
 of Pd-MgO/C **catalyst** is due to the synergistic effect of Pd/C
 and Pd/MgO components. CO chemisorption results indicate the formation of
 bigger particles of Pd in Pd-MgO/C **catalyst** and the formation of
 MgF₂ from MgO (on reaction with HF released during the reaction), induce
 electron deficient surface so that the rate of the desorption of
 intermediate CF₂* adsorbed species is more facile yielding CH₂F₂.

IT 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses)
 (Activated; promotional effect of magnesia addition to active carbon supported Pd **catalyst** on characteristics and **hydrodechlorination** activity of CCl₂F₂)

RN 7440-44-0 HCAPLUS

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

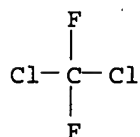
C

IT 75-71-8, Dichlorodifluoromethane

RL: RCT (Reactant); RACT (Reactant or reagent)
 (promotional effect of magnesia addition to active carbon supported Pd **catalyst** on characteristics and **hydrodechlorination** activity of CCl₂F₂)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)

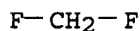


IT 75-10-5P, Difluoromethane

RL: SPN (Synthetic preparation); PREP (Preparation)
 (promotional effect of magnesia addition to active carbon supported Pd **catalyst** on characteristics and **hydrodechlorination** activity of CCl₂F₂)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 9 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:90379 HCAPLUS

DOCUMENT NUMBER: 140:323163

TITLE: **Hydrodechlorination of dichlorodifluoromethane (CFC-12) on Pd-Pt/Al₂O₃ catalysts**

AUTHOR(S): Legawiec-Jarzyna, Marta; Srebowata, Anna; Juszczak, Wojciech; Karpinski, Zbigniew

CORPORATE SOURCE: Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, PL-01224, Pol.

SOURCE: Catalysis Today (2004), 88(3-4), 93-101
 CODEN: CATTEA; ISSN: 0920-5861

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A series of alumina-supported palladium-platinum **catalysts** of 1-2.8 weight% overall metal loading were prepared by incipient wetness impregnation and investigated in the reaction of

dichlorodifluoromethane with dihydrogen at 160-180°C. All samples had high metal dispersion, which, in combination with a low metal loading, made phys. characterization of **catalysts** difficult. Temperature-programmed hydride decomposition, which appeared to be a promising technique for diagnosing the quality of palladium-containing systems, appeared less informative, because, due to high metal dispersion, no tested samples showed a β -PdH phase formation. A 2-2.5-fold increase in **hydrodechlorination** activity and a considerable enhancement of the selectivity towards **difluoromethane** (from 46 to .apprx.60%, at 180°C) are obtained upon introducing small amts. (up to 20 atomic%) of platinum to palladium. Further increase of platinum content lowers both the activity and selectivity. This synergistic effect must follow from a considerable effect of interaction between palladium (active component) and platinum (much less active component). CHClF_2 is produced in larger amts. on monometallic 1 weight% Pt/ Al_2O_3 **catalyst** (selectivity 28% at 180°C and higher at lower temps.), whereas Pd and Pd-Pt samples form only small amts. of this product. This suggests that the catalytic behavior of palladium is largely preserved in the bimetallic samples. As, after reaction the most active and selective Pd-Pt **catalysts** (with 10 and 20 atomic% Pt) contained lesser amts. of carbon than the other (less active) **catalysts**, it is considered that small amts. of platinum introduced (to palladium) are beneficial for maintaining the **catalyst** surface less blocked by carbon species, and in effect, more active.

IT 75-10-5P, HFC-32

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(from **hydrodechlorination** of **dichlorodifluoromethane** on Pd-Pt/ Al_2O_3 **catalysts**)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

IT 1344-28-1, Alumina, uses

RL: CAT (Catalyst use); USES (Uses)

(**hydrodechlorination** of **dichlorodifluoromethane** on Pd-Pt/ Al_2O_3 **catalysts**)

RN 1344-28-1 HCAPLUS

CN Aluminum oxide (Al_2O_3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

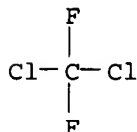
IT 75-71-8, CFC-12

RL: RCT (Reactant); RACT (Reactant or reagent)

(**hydrodechlorination** of **dichlorodifluoromethane** on Pd-Pt/ Al_2O_3 **catalysts**)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT:

36

THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 10 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2003:960242 HCAPLUS

DOCUMENT NUMBER: 141:245119

TITLE: Transformation of Chlorofluorocarbons Through
Catalytic Hydrodehalogenation

AUTHOR(S): Rao, P. Kanta; Rao, K. S. Rama; Padmasri, A. Hari

CORPORATE SOURCE: Catalysis and Physical Chemistry Division, Indian
Institute of Chemical Technology, Hyderabad, 500007,
India

SOURCE: CATTECH (2003), 7(6), 218-225

CODEN: CATTFB; ISSN: 1384-6566

PUBLISHER: Kluwer Academic/Plenum Publishers

DOCUMENT TYPE: Journal; General Review

LANGUAGE: English

AB A review. Catalytic hydrogenolysis is effective for conversion of
ozone-depleting chlorofluorocarbons into ozone-benign substances.
Selective **hydrodechlorination** of **CFC-12**
yields **HFC-32**, which has zero ozone depletion
potential, and is suitable for use as deep refrigerant. Various Pd
catalyst/support systems were evaluated and found suitable for
selective **hydrodechlorination** of **CCl₂F₂**. Bimetallic
catalysts, e.g., Pd-Bi, Pd-Sb, Pd-Ag, and Pd-Ru, significantly
suppressed the formation of **CH₄**, except for Ru-Pd/carbon-coated alumina
support. The **catalysts** showed long-term stability with almost
constant conversion and selectivity levels for up to 50 h.

IT 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses)

(alumina-coated support; **hydrodechlorination** of
chlorofluorocarbons with Pd **catalysts** into ozone-benign
refrigerants)

RN 7440-44-0 HCAPLUS

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 75-10-5P, HFC-32

RL: PNU (Preparation, unclassified); PREP (Preparation)
(**hydrodechlorination** of chlorofluorocarbons with Pd
catalysts into ozone-benign refrigerants)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

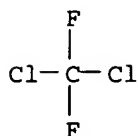
F-CH₂-F

IT 75-71-8, CFC-12

RL: RCT (Reactant); RACT (Reactant or reagent)
(**hydrodechlorination** of chlorofluorocarbons with Pd
catalysts into ozone-benign refrigerants)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)

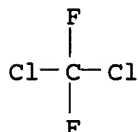


IT 1344-28-1, Alumina, uses
 RL: CAT (Catalyst use); USES (Uses)
 (support of carbon-coated; **hydrodechlorination** of
 chlorofluorocarbons with Pd **catalysts** into ozone-benign
 refrigerants)
 RN 1344-28-1 HCAPLUS
 CN Aluminum oxide (Al2O3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

REFERENCE COUNT: 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 11 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 2003:451652 HCAPLUS
 DOCUMENT NUMBER: 139:324987
 TITLE: **Hydrodechlorination of
 dichlorodifluoromethane (CFC-
 12) over Pd/Al2O3 and Pd-Au/Al2O3
 catalysts**
 AUTHOR(S): Legawiec-Jarzyna, Marta; Srebowata, Anna; Karpinski,
 Zbigniew
 CORPORATE SOURCE: Institute of Physical Chemistry of the Polish Academy
 of Sciences, Warsaw, PL-01224, Pol.
 SOURCE: Reaction Kinetics and Catalysis Letters (2003), 79(1),
 157-163
 CODEN: RKCLAU; ISSN: 0133-1736
 PUBLISHER: Akademiai Kiado
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB During an initial stage of the reaction of CCl2F2 with hydrogen on
 alumina-supported Pd and Pd-Au **catalysts**, an extensive
 defluorination occurs. However, at steady state, this undesired
 defluorination is greatly reduced; CH4 and CH2F2 constitute the only major
 reaction products. A temperature programmed hydrogen treatment study shows
 retention of fluorine (and carbon) in used **catalysts**.
 IT 75-71-8, **Dichlorodifluoromethane**
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (CFC-12; **hydrodechlorination** of
dichlorodifluoromethane (CFC-12) over
Pd/Al2O3 and Pd-Au/Al2O3 catalysts)
 RN 75-71-8 HCAPLUS
 CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 1344-28-1, Alumina, uses

RL: CAT (Catalyst use); USES (Uses)
 (catalyst support; hydrodechlorination of
 dichlorodifluoromethane (CFC-12) over
 Pd/Al₂O₃ and Pd-Au/Al₂O₃ catalysts)

RN 1344-28-1 HCAPLUS

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT 75-10-5, Difluoromethane

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
 (hydrodechlorination product of
 dichlorodifluoromethane (CFC-12) over
 Pd/Al₂O₃ and Pd-Au/Al₂O₃ catalysts)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 12 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2003:319493 HCAPLUS

DOCUMENT NUMBER: 138:323029

TITLE: Synthesis of highly-active Al-modified
 carbon-supported palladium catalyst

INVENTOR(S): Murthy, Janmanchi K.; Shekar, Sridara C.; Ramarao,
 Kamaraju S.; Raju, Burri D.; Raghavan, Kondapuram V.

PATENT ASSIGNEE(S): India

SOURCE: U.S. Pat. Appl. Publ., 4 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003078461	A1	20030424	US 2001-983230	20011023
US 6624109	B2	20030923		
EP 1308206	A1	20030507	EP 2001-309134	20011029
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2003126692	A2	20030507	JP 2001-332138	20011030
PRIORITY APPLN. INFO.:			US 2001-983230	A 20011023

OTHER SOURCE(S): CASREACT 138:323029

AB The title catalyst is made by simultaneously impregnating
 activated C with a Pd precursor and an Al precursor. The C-supported Pd
 catalyst is useful for the hydrodechlorination of
 dichlorodifluoromethane to produce difluoromethane. The
 combined beneficial properties of both alumina and palladium and activated
 carbon to secure greater dispersion of alumina are an added advantage.
 The conversion of CFC-12 is on the order of 85% and
 the selectivity to HFC-32 is on the order of 85% at
 atmospheric pressure.

IT 1344-28-1, Alumina, uses

RL: CAT (Catalyst use); USES (Uses)

(highly-active Al-modified carbon-supported palladium catalyst

for hydrodechlorination of dichlorodifluoromethane
to difluoromethane)

RN 1344-28-1 HCAPLUS

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); PREP (Preparation)
(highly-active Al-modified carbon-supported palladium catalyst
for hydrodechlorination of dichlorodifluoromethane
to difluoromethane)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

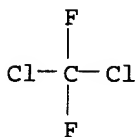
F-CH₂-F

IT 75-71-8, Dichlorodifluoromethane

RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrodechlorination; highly-active Al-modified
carbon-supported palladium catalyst for
hydrodechlorination of dichlorodifluoromethane to
difluoromethane)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)

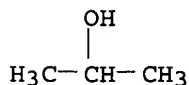


IT 555-31-7, Aluminum isopropoxide

RL: CAT (Catalyst use); USES (Uses)
(precursor; highly-active Al-modified carbon-supported palladium
catalyst for hydrodechlorination of
dichlorodifluoromethane to difluoromethane)

RN 555-31-7 HCAPLUS

CN 2-Propanol, aluminum salt (9CI) (CA INDEX NAME)



● 1/3 Al

IT 7440-44-0, Carbon, processes

RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process);
PYP (Physical process); PROC (Process); USES (Uses)
(support; highly-active Al-modified carbon-supported palladium
catalyst for hydrodechlorination of
dichlorodifluoromethane to difluoromethane)

RN 7440-44-0 HCAPLUS

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

L24 ANSWER 13 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2003:313302 HCAPLUS

DOCUMENT NUMBER: 139:86949

TITLE: Selective hydrogenolysis of
dichlorodifluoromethane (CCl₂F₂)
over CCA supported palladium bimetallic
catalysts

AUTHOR(S): Chandra Shekar, S.; Krishna Murthy, J.; Kanta Rao, P.;
Rama Rao, K. S.; Kemnitz, E.

CORPORATE SOURCE: Catalysis Section, Indian Institute of Chemical
Technology, Hyderabad, 500007, India

SOURCE: Applied Catalysis, A: General (2003), 244(1), 39-48
CODEN: ACAGE4; ISSN: 0926-860X

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 139:86949

AB The effect of La, Bi, Sb, Sn, Ba, and Zn promoters on the activity of
carbon covered alumina (CCA) supported Pd **catalysts** for the
hydrogenolysis of CCl₂F₂ was investigated. Bi and Sb promoters improve
not only the thermal stability, but also the selectivity to CH₂F₂. The
Sn-promoted **catalyst** exhibits high selectivity to CHClF₂. The
improved activity arises from intermetallic compound formation as evidenced
by the XRD and TPR data on the bimetallic **catalysts**. The effect
of the promoters was screened in terms of partial dehalogenation activity
and thermal stability for **hydrodechlorination** of CCl₂F₂ to
maximize CH₂F₂ yield.

IT 1344-28-1, Alumina, uses 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(selective **hydrodechlorination** of CCl₂F₂ to CH₂F₂ using
promoted Pd/C/Al₂O₃ **catalysts**)

RN 1344-28-1 HCAPLUS

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 7440-44-0 HCAPLUS

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 75-10-5P, Difluoromethane

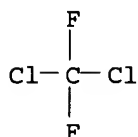
RL: IMF (Industrial manufacture); PREP (Preparation)
(selective **hydrodechlorination** of CCl₂F₂ to CH₂F₂ using
promoted Pd/C/Al₂O₃ **catalysts**)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

IT 75-71-8, Dichlorodifluoromethane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (selective **hydrodechlorination** of CCl_2F_2 to CH_2F_2 using
 promoted Pd/C/ Al_2O_3 **catalysts**)
 RN 75-71-8 HCAPLUS
 CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)

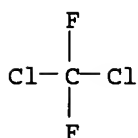


REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 14 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 2003:144624 HCAPLUS
 DOCUMENT NUMBER: 138:357495
 TITLE: Catalytic removal of chlorine from organic compounds
 AUTHOR(S): Karpinski, Zbigniew; Pielaszek, Jerzy; Bonarowska,
 Magdalena
 CORPORATE SOURCE: Institute of Physical Chemistry of PAS, Warsaw,
 PL-01224, Pol.
 SOURCE: Prace Naukowe Instytutu Chemii i Technologii Nafty i
 Wegla Politechniki Wroclawskiej (2002), 57, 137-142
 CODEN: PNTNAI
 PUBLISHER: Oficyna Wydawnicza Politechniki Wroclawskiej
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB Several C-supported, bimetallic Pd-Au systems were prepared and screened as
catalysts for the **hydrodechlorination** of
dichlorodifluoromethane (CFC-12). Since
 catalytic behavior depends very much on the extent of Pd-Au alloying, it
 was necessary to ensure proper conditions for mutual interaction of both
 alloy components after their deposition on the support. The direct redox
 reaction, which involves a reductive deposition of Au ions on pre-reduced
 Pd material appeared very useful. Characterizing these **catalysts**
 by x-ray diffraction and other methods showed a higher degree of Pd-Au
 interaction than that in Pd-Au/C **catalysts** prepared by
 impregnation. Kinetic studies indicated an intimate contact of Pd and Au
 is essential to improve selectivity to **difluoromethane** (from
 .apprx.70% for Pd/C to .apprx.90% for Pd-Au/C **catalysts** prepared
 by direct redox method). Large amts. of C originated from the CFC
 -12 mol. enter Pd lattice during **hydrodechlorination**.
 During the reaction, part of this C can be hydrogenated from the
catalyst, giving rise to higher selectivity toward CH_4 .
 Well-mixed, highly selective toward CH_2F_2 , Pd-Au **catalysts**
 absorb much less C.
 IT 75-10-5, Difluoromethane
 RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical,
 engineering or chemical process); FORM (Formation, nonpreparative); PROC
 (Process)
 (air pollution control and hydrofluorocarbon synthetic preparation by
 selective catalytic removal of chlorine from CFC12 via
hydrodechlorination)
 RN 75-10-5 HCAPLUS
 CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-71-8, CFC12
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
 (air pollution control and hydrofluorocarbon synthetic preparation by selective catalytic removal of chlorine from CFC12 via **hydrodechlorination**)
 RN 75-71-8 HCAPLUS
 CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (palladium and gold supported by activated; air pollution control and hydrofluorocarbon synthetic preparation by selective catalytic removal of chlorine from CFC12 via **hydrodechlorination**)
 RN 7440-44-0 HCAPLUS
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 15 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 2002:981426 HCAPLUS
 DOCUMENT NUMBER: 138:273265
 TITLE: Pd supported on fluorinated carbon covered alumina (FCCA) a high performance **catalyst** in the **hydrodechlorination** of **dichlorodifluoromethane**
 AUTHOR(S): Chandra Shekar, S.; Krishna Murthy, J.; Kanta Rao, P.; Rama Rao, K. S.
 CORPORATE SOURCE: Catalysis Section, Indian Institute of Chemical Technology, Hyderabad, 500 007, India
 SOURCE: Catalysis Communications (2003), 4(2), 39-44
 CODEN: CCAOAC; ISSN: 1566-7367
 PUBLISHER: Elsevier Science B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 OTHER SOURCE(S): CASREACT 138:273265
 AB A **catalyst** based on Pd deposited on fluorocarbon covered alumina (Pd/FCCA) exhibited high activity in **hydrodechlorination** of CCl₂F₂ and high selectivity toward CH₂F₂ compared to those of Pd supported on carbon covered alumina (Pd/CCA), Pd/C, and Pd/Al₂O₃ under identical reaction conditions. The formation of α-AlF₃ and carbon coverage on

Al₂O₃, during the preparation of FCCA by cracking of fluorobenzene on Al₂O₃ resulted in minimizing the support-active component interactions and stabilized the support. The **hydrodechlorination** reaction is of interest in transformation of chlorofluorocarbons, e.g., for disposal, to ozone-friendly hydrofluorocarbons.

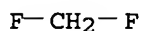
IT 75-10-5P, **Difluoromethane**

RL: IMF (Industrial manufacture); PREP (Preparation)

(role of acidic AlF₃ sites of fluorinated carbon-alumina support in activity of Pd catalyst in **hydrodechlorination** of **dichlorodifluoromethane**)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



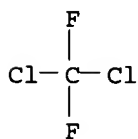
IT 75-71-8, **Dichlorodifluoromethane**

RL: RCT (Reactant); RACT (Reactant or reagent)

(role of acidic AlF₃ sites of fluorinated carbon-alumina support in activity of Pd catalyst in **hydrodechlorination** of **dichlorodifluoromethane**)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



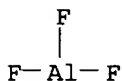
IT 7784-18-1P, **Aluminum fluoride** (AlF₃)

RL: CAT (Catalyst use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)

(support acidic species; role of acidic AlF₃ sites of fluorinated carbon-alumina support in activity of Pd catalyst in **hydrodechlorination** of **dichlorodifluoromethane**)

RN 7784-18-1 HCAPLUS

CN Aluminum fluoride (AlF₃) (9CI) (CA INDEX NAME)



IT 1344-28-1, **Alumina, processes**

RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(support; role of acidic AlF₃ sites of fluorinated carbon-alumina support in activity of Pd catalyst in **hydrodechlorination** of **dichlorodifluoromethane**)

RN 1344-28-1 HCAPLUS

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

REFERENCE COUNT:

32

THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 16 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:925032 HCAPLUS

DOCUMENT NUMBER: 138:239655

TITLE: Selective hydrogenolysis of
dichlorodifluoromethane on carbon covered
alumina supported palladium **catalyst**

AUTHOR(S): Chandra Shekar, S.; Krishna Murthy, J.; Kanta Rao, P.;
Rama Rao, K. S.

CORPORATE SOURCE: Catalysis Section, Indian Institute of Chemical
Technology, Hyderabad, 500 007, India

SOURCE: Journal of Molecular Catalysis A: Chemical (2003),
191(1), 45-59

CODEN: JMCCF2; ISSN: 1381-1169

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB γ -Alumina is modified by carbon coverage and the resulting
carbon-covered alumina (CCA) is used in the preparation of supported Pd
catalysts with varying Pd loadings. The prepared **catalysts**
have been characterized by BET surface area, CO chemisorption, X-ray
diffraction (XRD), and temperature programmed reduction (TPR). The catalytic
activities have been tested for the selective hydrogenolysis of
dichlorodifluoromethane to **difluoromethane**. TPR studies
reveal that fresh Pd/CCA **catalysts** at lower Pd loading (up to 4
weight%) exhibit features of Pd/Al₂O₃ (decomposition of β -PdHx) along with
Pd/C (reaction of Cl⁻ with hydrogen) and beyond 4 weight%, only Pd/C features
are observed. TPR of spent **catalysts** reveals an increase in the
intensity of β -PdHx with increase in Pd loading, indicating the
reorganization of Pd particles during the course of the
hydrodechlorination. TPR of CCA and active carbon supports showed
that the nature of the carbon is somewhat different in CCA and active
carbon. XRD data have shown that some uncovered alumina is converted into
its hydroxide fluoride. High selectivity to **HFC-32**
(.apprx.95%) over 4 weight% Pd/CCA **catalyst** at 220°C is
attributed to the beneficial role of carbon coverage on the
 γ -alumina.

IT 75-10-5P, **HFC-32**

RL: IMF (Industrial manufacture); PREP (Preparation)
(**catalysts** for selective hydrogenolysis of
dichlorodifluoromethane to)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

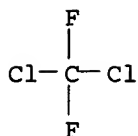
F- CH₂- F

IT 75-71-8, **Dichlorodifluoromethane**

RL: RCT (Reactant); RACT (Reactant or reagent)
(**catalysts** for selective hydrogenolysis to
difluoromethane)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 1344-28-1, Alumina, uses 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (in **catalyst** for selective hydrogenolysis of
dichlorodifluoromethane)
 RN 1344-28-1 HCAPLUS
 CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
 RN 7440-44-0 HCAPLUS
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

REFERENCE COUNT: 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 17 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:790762 HCAPLUS

DOCUMENT NUMBER: 138:153130

TITLE: **Hydrodechlorination of
 dichlorodifluoromethane (CFC-
 12) on silica-supported palladium and
 palladium-gold catalysts**

AUTHOR(S): Malinowski, A.

CORPORATE SOURCE: Institute of Physical Chemistry of the Polish Academy
 of Sciences, Warsaw, PL-01224, Pol.

SOURCE: Polish Journal of Chemistry (2002), 76(10), 1461-1466
 CODEN: PJCHDQ; ISSN: 0137-5083

PUBLISHER: Polish Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 138:153130

AB Silica-supported palladium and palladium-gold **catalysts** were
 screened in the reaction of **dichlorodifluoromethane** with
 dihydrogen at 180°C. The Au-containing sample appeared superior as far
 as the selectivity towards **difluoromethane** (desired reaction
 product) is concerned (95% vs. .apprx.30% for Pd/SiO₂). A comparative
 X-ray diffraction study of the **catalysts**, before and after
 reaction, confirmed our earlier findings that during the
hydrodechlorination massive amts. of carbon originated from CCl₂F₂
 dissolve in palladium. However, a similar conclusion cannot be drawn from
 XRD studies of the Pd-Au/SiO₂ **catalyst**, because upon entering Pd
 bulk both gold and carbon may produce analogous shifts of the XRD
 reflections. For that reason, temperature programmed hydrogenation of carbon
 deposited in the Pd and a Pd-Au **catalyst** was used. In contrast
 to the behavior of monometallic Pd/SiO₂, only insignificant quantity of
 carbon was found in the bimetallic Pd-Au/SiO₂ sample subjected to
hydrodechlorination. This result supports the idea that a
 complete hydrodehalogenation of CCl₂F₂ to methane would occur via bare
 carbon ad-species. Thus, one can associate a superior catalytic behavior of

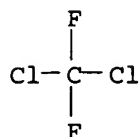
Pd-Au alloy **catalysts** (selectivity to CH₂F₂ .apprx.95%) with a low abundance of Cl ad-species.

IT 75-71-8, **CFC-12**

RL: RCT (Reactant); RACT (Reactant or reagent)
(**hydrodechlorination of dichlorodifluoromethane (CFC-12)** on silica-supported palladium and palladium-gold **catalysts**)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)

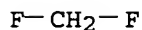


IT 75-10-5P, **Difluoromethane**

RL: SPN (Synthetic preparation); PREP (Preparation)
(**hydrodechlorination of dichlorodifluoromethane (CFC-12)** on silica-supported palladium and palladium-gold **catalysts**)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 18 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:652725 HCAPLUS

DOCUMENT NUMBER: 137:354672

TITLE: **Hydrodechlorination of dichlorodifluoromethane over novel CrF₃ supported palladium catalysts**

AUTHOR(S): Cao, Yu Cai; Jiang, Xuan Zhen

CORPORATE SOURCE: Department of Chemistry, Zhejiang University, Hangzhou, 310027, Peop. Rep. China

SOURCE: Indian Journal of Chemistry, Section A: Inorganic, Bio-inorganic, Physical, Theoretical & Analytical Chemistry (2002), 41A(8), 1607-1611

CODEN: ICACEC; ISSN: 0376-4710

PUBLISHER: National Institute of Science Communication

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Novel CrF₃ supported palladium **catalysts** have been prepared through two different precursors i.e. dichlorobis(triphenylphosphine) palladium (DCTPPP) and PdCl₂ for the **hydrodechlorination of CFC-12**. These **catalysts** exhibited improved catalytic activities in **hydrodechlorination of CFC-12** as compared with conventional Pd/γ-Al₂O₃. Particularly, high selectivities (.apprx.81%) of CH₂F₂ formation have been achieved over DCTPPP/CrF₃. The improved catalytic performance may be attributed to the nature of support CrF₃ and the formation of fine palladium particles in the **catalysts**.

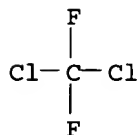
IT 75-71-8, **Cfc 12**

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(hydrodechlorination of CFC-12 over CrF₃ supported palladium)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-10-5, Difluoromethane

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)

(hydrodechlorination of CFC-12 over CrF₃ supported palladium)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 19 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:502388 HCAPLUS

DOCUMENT NUMBER: 137:264692

TITLE: Pd-Au/Sibunit Carbon **Catalysts**: Characterization and Catalytic Activity in Hydrodechlorination of Dichlorodifluoromethane (CFC-12)

AUTHOR(S): Bonarowska, M.; Pielaszek, J.; Semikolenov, V. A.; Karpinski, Z.

CORPORATE SOURCE: Department of Catalysis on Metals, Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, PL-01224, Pol.

SOURCE: Journal of Catalysis (2002), 209(2), 528-538
CODEN: JCTLA5; ISSN: 0021-9517

PUBLISHER: Elsevier Science

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A series of Sibunit C-supported Pd-Au **catalysts** prepared by various methods were characterized and investigated for hydrodechlorination of CFC-12. The selectivity to CH₂F₂ was increased with the introduction of Au to the Pd **catalyst**; however, this enhancement depends very much on the degree of Pd-Au alloying. For **catalysts** prepared by the direct redox method, the selectivity increased from <70% for Pd to nearly 90% for bimetallic **catalysts** at 180°. This high selectivity enhancement was not observed for **catalysts** prepared by impregnation methods.

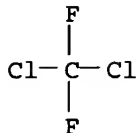
IT 75-71-8, CFC-12

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)

(selective **hydrodechlorination** of CFC-12
to CH₂F₂ using C-supported Pd-Au **catalysts**)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); PREP (Preparation)

(selective **hydrodechlorination** of CFC-12
to CH₂F₂ using C-supported Pd-Au **catalysts**)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 20 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:496411 HCAPLUS

DOCUMENT NUMBER: 137:249458

TITLE: Supported palladium phthalocyanine **catalysts**
in **hydrodechlorination** of CCl₂F₂

AUTHOR(S): Cao, Yu Cai; Jiang, Xuan Zhen

CORPORATE SOURCE: Department of Chemistry, Zhejiang University, Yuquan,
Hangzhou, 310027, Peop. Rep. China

SOURCE: Journal of Molecular Catalysis A: Chemical (2002),
184(1-2), 183-189

CODEN: JMCCF2; ISSN: 1381-1169

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Supported palladium phthalocyanine was found to be an interesting
catalyst with good stability for selective conversion of CCl₂F₂
into CH₂F₂ under flowing hydrogen. Relatively high selectivities towards
CH₂F₂ formation over palladium phthalocyanine **catalysts** with
fluoride supports were achieved at limited conversion levels (<10%).
Particularly, supported palladium phthalocyanine exhibited excellent
stability even at low H₂/CCl₂F₂ molar ratio in the corrosive reaction
conditions due to the formation of HCl and HF. The fractionally reduced
palladium in palladium phthalocyanine was suggested to be the main active
site for the catalytic **hydrodechlorination**.

IT 1344-28-1, Alumina, uses 7440-44-0, Carbon, uses
7784-18-1, Aluminum trifluoride

RL: CAT (Catalyst use); USES (Uses)

(supported palladium phthalocyanine **catalysts** in
hydrodechlorination of CCl₂F₂)

RN 1344-28-1 HCAPLUS

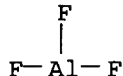
CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 7440-44-0 HCAPLUS
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

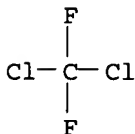
RN 7784-18-1 HCAPLUS
 CN Aluminum fluoride (AlF₃) (9CI) (CA INDEX NAME)



IT 75-10-5P, Difluoromethane
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (supported palladium phthalocyanine **catalysts** in
hydrodechlorination of CCl₂F₂)
 RN 75-10-5 HCAPLUS
 CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-71-8, Dichlorodifluoromethane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (supported palladium phthalocyanine **catalysts** in
hydrodechlorination of CCl₂F₂)
 RN 75-71-8 HCAPLUS
 CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 53 THERE ARE 53 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 21 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 2002:435326 HCAPLUS
 DOCUMENT NUMBER: 137:156404
 TITLE: Highly selective zirconium oxychloride modified Pd/C
catalyst in the hydrodechlorination
of dichlorodifluoromethane to
difluoromethane
 AUTHOR(S): Murthy, J. Krishna; Shekar, S. Chandra; Kumar, V.
 Siva; Rao, K. S. Rama
 CORPORATE SOURCE: C & PC Division, Indian Institute of Chemical
 Technology, Hyderabad, 500 007, India
 SOURCE: Catalysis Communications (2002), 3(4), 145-149
 CODEN: CCAOAC; ISSN: 1566-7367
 PUBLISHER: Elsevier Science B.V.
 DOCUMENT TYPE: Journal

LANGUAGE: English

AB Zirconium oxychloride-modified active carbon-supported palladium **catalysts** appear to be a promising system in the **hydrodechlorination** of CCl_2F_2 to yield CH_2F_2 in greater yields, showing an altogether different product distribution compared to Pd/C and Pd/ZrO₂ **catalysts**. The **catalysts** have been characterized by BET-surface area, CO-chemisorption, X-ray diffraction, temperature-programmed reduction anal., and fluorine contents in used **catalysts**. The interaction of Zr species with Pd and the formation of fluorinated zirconium species during the course of reaction led to the higher selectivity towards CH_2F_2 .

IT 7440-44-0, Norit, uses

RL: CAT (Catalyst use); USES (Uses)

(activated; zirconyl chloride-modified Pd/C **catalyst** for **hydrodechlorination** of **dichlorodifluoromethane** to **difluoromethane**)

RN 7440-44-0 HCAPLUS

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); PREP (Preparation)

(zirconyl chloride-modified Pd/C **catalyst** for **hydrodechlorination** of **dichlorodifluoromethane** to)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

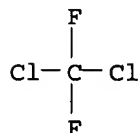
IT 75-71-8, Dichlorodifluoromethane

RL: RCT (Reactant); RACT (Reactant or reagent)

(zirconyl chloride-modified Pd/C **catalyst** for **hydrodechlorination** of **dichlorodifluoromethane** to **difluoromethane**)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT:

26

THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 22 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:134536 HCAPLUS

DOCUMENT NUMBER: 136:385857

TITLE:

Hydrodechlorination of Freon R-12 (CCl_2F_2) over Pd-Au bimetallic

catalysts supported on various active carbons

AUTHOR(S): Bonarowska, Magdalena; Menegazzo, Federica; Juszczak,

CORPORATE SOURCE: Wojciech; Karpinski, Zbigniew
 Zakl. Katalizy na Metalach, Inst. Chem. Fiz., PAN,
 Warsaw, 01-224, Pol.
 SOURCE: Chemia i Inzynieria Ekologiczna (2001), 8(11),
 1121-1127
 CODEN: CIEKFX; ISSN: 1231-7098
 PUBLISHER: Towarzystwo Chemii i Inzynierii Ekologicznej
 DOCUMENT TYPE: Journal
 LANGUAGE: Polish

AB Different kinds of active carbon were used as a support in preparation of bimetallic Pd-Au **catalysts**. These carbons differed in respect of sp. surface area and porous structure. Preparation methods allowed to achieve a considerable extent of bimetal mixing in the supported **catalysts**. The Pd/C and Pd-Au/C **catalysts** were tested in the reaction of **hydrodechlorination** of CFC-12 (CCl₂F₂). Generally, addition of Au to Pd/C introduces a marked increase in the selectivity towards CH₂F₂ (desired reaction product). However, the kind of carbon support was a primary importance for the course of hydrodehalogenation. Application of active carbon characterized by a high surface area and microporous structure led to the selectivity to CH₂F₂ inferior to that obtained for carbons with a larger proportion of meso- and macropores. It is speculated that a significant part of a highly dispersed (bi)metal located in micropores catalyzes undesired consecutive reaction of hydrodehalogenation of CH₂F₂ to methane.

IT 7440-44-0, Activated carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (activated; **hydrodechlorination** of Freon R-12 over Pd-Au bimetallic **catalysts** supported on various active carbons)

RN 7440-44-0 HCAPLUS

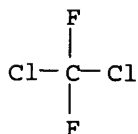
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 75-71-8, r 12
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
 (**hydrodechlorination** of Freon R-12 over Pd-Au bimetallic **catalysts** supported on various active carbons)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-10-5, Difluoromethane
 RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
 (**hydrodechlorination** of Freon R-12 over Pd-Au bimetallic **catalysts** supported on various active carbons)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

L24 ANSWER 23 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2001:883498 HCAPLUS

DOCUMENT NUMBER: 136:221173

TITLE: **Hydrodechlorination of CFC-12 over novel supported palladium catalysts**

AUTHOR(S): Cao, Yu Cai; Jiang, Xuan Zhen; Song, Wei Hong; Bai, Zhan Qi; Fang, Xiao Qing

CORPORATE SOURCE: Department of Chemistry, Zhejiang University, Hangzhou, 310027, Peop. Rep. China

SOURCE: Catalysis Letters (2001), 76(1-2), 53-57
CODEN: CALEER; ISSN: 1011-372X

PUBLISHER: Kluwer Academic/Plenum Publishers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Novel supported palladium **catalysts** were prepared through organometallic Pd compds. including dichlorobistriphenylphosphine palladium (DCTPPP) and dithiocyanatobistriphenylphosphine palladium (DTTPPP) for the **hydrodechlorination of CFC-12**. These **catalysts** exhibited excellent catalytic activities in **hydrodechlorination of CFC-12**. Particularly, high selectivities of CH₂F₂ formation were achieved over the **catalysts**, DCTPPP/MgF₂ with 88.1% and DTTPPP/MgF₂ with 85.8%, at a limited conversion level (<5%). No obvious deactivation was observed for DCTPPP/MgF₂ and DTTPPP/MgF₂ **catalysts** within 60 h. The higher catalytic activity, CH₂F₂ selectivity and **catalyst** stability may be mainly attributed to high dispersions of palladium.

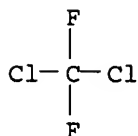
IT 75-71-8, Cfc 12

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(hydrodechlorination of CFC-12 over supported palladium **catalysts**)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-10-5, Difluoromethane

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)

(hydrodechlorination of CFC-12 over supported palladium **catalysts**)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 24 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2001:861368 HCAPLUS

DOCUMENT NUMBER: 136:236105

TITLE: **Hydrodechlorination of CCl₂F₂ (CFC-12) over Pd-Au/C catalysts**

AUTHOR(S): Bonarowska, M.; Burda, B.; Juszczak, W.; Pielaszek, J.; Kowalczyk, Z.; Karpinski, Z.

CORPORATE SOURCE: Institute of Physical Chemistry, Department of Catalysis on Metals, Polish Academy of Sciences, Warsaw, 01-224, Pol.

SOURCE: Applied Catalysis, B: Environmental (2001), 35(1), 13-20

CODEN: ACBEE3; ISSN: 0926-3373

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Several C-supported Pd-Au **catalysts** prepared by direct redox reaction method and characterized by various techniques were examined for the reaction of **dichlorodifluoromethane (CFC-12)** with H₂. Selectivity towards **difluoromethane** (the desired reaction product) was increased upon introducing Auto Pd, from .apprx.72 to .apprx.86%, at 180°. Such a selectivity enhancement was not observed in previous studies when Pd-Au/C **catalysts** prepared by incipient wetness impregnation showed inadequate extent of Pd-Au alloying. Prepare conditions for Pd-Au/C **catalysts** by the direct redox reaction method affected the amount of deposited metals and the degree of Pd-Au mixing. The latter factor is essential in determining **catalyst** hydrodehalogenation behavior.

IT 75-10-5, **Difluoromethane**

RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)

(metal content and **catalyst** composition effect on **hydrodechlorination of dichlorodifluoromethane** over carbon-supported palladium-gold **catalyst** prepared by direct redox reaction method)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F- CH₂-F

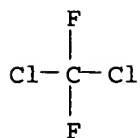
IT 75-71-8, **CFC12**

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)

(metal content and **catalyst** composition effect on **hydrodechlorination of dichlorodifluoromethane** over carbon-supported palladium-gold **catalyst** prepared by direct redox reaction method)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (palladium and gold supported by; metal content and **catalyst**
 composition effect on **hydrodechlorination** of
dichlorodifluoromethane over carbon-supported palladium-gold
catalyst prepared by direct redox reaction method)
 RN 7440-44-0 HCAPLUS
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 25 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2001:566384 HCAPLUS

DOCUMENT NUMBER: 136:169361

TITLE: Modified palladium **catalysts** for
hydrodechlorination of Freons

AUTHOR(S): Bonarowska, Magdalena; Juszczak, Wojciech; Malinowski,
 Artur; Karpinski, Zbigniew

CORPORATE SOURCE: Inst. Chem. Fiz., PAN, Warsaw, 01-224, Pol.

SOURCE: Adsorpcja i Kataliza w Ochronie Srodowiska, Prace
 Ogolnopolskiego Mikrosymposium Tematycznego, 8th,
 Poznan, Poland, Dec. 1, 2000 (2000), 7-12. Editor(s):
 Sarbak, Zenon. Uniwersytet im. Adama Mickiewicza,
 Wydzial Chemii: Poznan, Pol.
 CODEN: 69BPT4

DOCUMENT TYPE: Conference

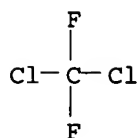
LANGUAGE: Polish

AB Catalytic **hydrodechlorination** of Freon 12
 (CCl₂F₂) in the presence of Au-modified Pd **catalyst** (Pd-Au/SiO₂)
 was studied with the aim to determine the usefulness of the incorporation of Au
 into the **catalyst**. Using the Au-Pd alloy instead of pure Pd
 resulted in an increase of the reaction selectivity towards CH₂F₂ from
 .apprx.40% to 90%. The SiO₂ support is not chemical resistant towards HF and
 cannot be, therefore, used under technol. conditions, but the beneficial
 addition of Au was proven.

IT 75-71-8, Dichlorodifluoromethane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (gold promoter for palladium **catalysts** for
hydrodechlorination of dichlorodifluoromethane)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); PREP (Preparation)
(gold promoter for palladium **catalysts** for
hydrodechlorination of dichlorodifluoromethane to)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



L24 ANSWER 26 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2001:503377 HCAPLUS

DOCUMENT NUMBER: 135:226559

TITLE: Novel catalytic **hydrodechlorination** of
CCl₂F₂ over supported PdCl₂-(n-C₄H₉)₄N+Cl⁻ molten
salts

AUTHOR(S): Cao, Yu Cai; Jiang, Xuan Zhen

CORPORATE SOURCE: Department of Chemistry, Zhejiang University,
Hangzhou, 310027, Peop. Rep. China

SOURCE: Chinese Chemical Letters (2001), 12(6), 533-536
CODEN: CCLEE7; ISSN: 1001-8417

PUBLISHER: Chinese Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 135:226559

AB A novel supported liquid phase film **catalyst**, i.e., supported
PdCl₂-tetrabutylammonium chloride molten salts was found to be an
effective **catalyst** with good stability for selective
hydrodechlorination of CCl₂F₂ (CFC-12) to its
alternatives CH₂F₂ and CHClF₂. Addition of CoCl₂, GaCl₃ and CuCl₂ to
PdCl₂-(n-C₄H₉)₄N+Cl⁻ modifies the catalytic performance of supported
molten salts.

IT 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses)
(activated; preparation of palladium dichloride-tetrabutylammonium chloride
on activated carbon **catalysts** and their use for
hydrodechlorination of chlorofluorocarbons)

RN 7440-44-0 HCAPLUS

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

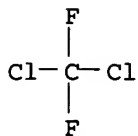
C

IT 75-71-8, Dichlorodifluoromethane

RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of palladium dichloride-tetrabutylammonium chloride on
activated carbon **catalysts** and their use for
hydrodechlorination of chlorofluorocarbons)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-10-5P, Difluoromethane

RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of palladium dichloride-tetrabutylammonium chloride on
 activated carbon **catalysts** and their use for
hydrodechlorination of chlorofluorocarbons)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 27 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2001:444186 HCAPLUS

DOCUMENT NUMBER: 135:244026

TITLE: Palladium hydrotalcites as precursors for the
 catalytic hydroconversion of CCl₂F₂ (**CFC-12**) and CHClF₂ (**HCFC-22**)

AUTHOR(S): Morato, A.; Alonso, C.; Medina, F.; Cesteros, Y.;
 Salagre, P.; Sueiras, J. E.; Tichit, D.; Coq, B.

CORPORATE SOURCE: ETSEQ, Departament d'Enginyeria Quimica, Universitat
 Rovira i Virgili, Tarragona, 43005, Spain

SOURCE: Applied Catalysis, B: Environmental (2001), 32(3),
 167-179

CODEN: ACBEE3; ISSN: 0926-3373

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The preparation of Pd hydrotalcite-like materials and their catalytic
 properties for hydroconversion of **CFC-12** and **HCFC-22**
 are reported. These materials are **catalysts** for selective
hydrodechlorination reactions. The influence of reaction temperature
 and H/CFC ratio on the hydrogenolysis was investigated. In the reaction
 of **CFC-12**, the main products are CH₂F₂, CH₄ and
 CHClF₂. For **HCFC-22**, the products are CH₂F₂, CHF₃ and CH₄. The highest
 conversion and selectivity to CH₂F₂ are attained on heavily loaded Pd
catalysts. High H/CFC ratios favor the formation of CH₂F₂.
 During the reaction, the formation of fluoride and Pd-carbide phases were
 detected.

IT 222632-88-4, Aluminum magnesium palladium oxide

RL: CAT (Catalyst use); USES (Uses)
 (chlorofluorocarbon hydroconversion to CH₂F₂ using Pd hydrotalcite
catalysts)

RN 222632-88-4 HCAPLUS

CN Aluminum magnesium palladium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component
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		Registry Number
O	x	17778-80-2
Pd	x	7440-05-3
Mg	x	7439-95-4
Al	x	7429-90-5

IT 75-10-5P

RL: IMF (Industrial manufacture); PREP (Preparation)
(chlorofluorocarbon hydroconversion to CH₂F₂ using Pd hydrotalcite
catalysts)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

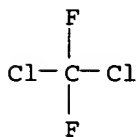
F-CH₂-F

IT 75-71-8, CFC-12

RL: RCT (Reactant); RACT (Reactant or reagent)
(chlorofluorocarbon hydroconversion to CH₂F₂ using Pd hydrotalcite
catalysts)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 52 THERE ARE 52 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 28 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2000:566729 HCAPLUS

DOCUMENT NUMBER: 133:251922

TITLE: **Hydrodechlorination of CCl₂F₂ (CFC
-12) by carbon- and MgF₂-supported palladium
and palladium-gold catalysts**

AUTHOR(S): Malinowski, A.; Juszczak, W.; Pielaszek, J.;
Bonarowska, M.; Wojciechowska, M.; Karpinski, Z.

CORPORATE SOURCE: Institute of Physical Chemistry of PAS, Warsaw,
PL-01224, Pol.

SOURCE: Studies in Surface Science and Catalysis (2000),
130C(International Congress on Catalysis, 2000, Pt.
C), 1991-1996

CODEN: SSCTDM; ISSN: 0167-2991

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB C- and MgF₂-supported Pd **catalysts** exhibited comparable
activity, selectivity pattern and stability in **hydrodechlorination**
of CCl₂F₂. Selective hydrodehalogenation to CH₂F₂ was a prevailing
reaction. Introduction of Au to supported Pd **catalysts** produced
different results, depending on whether Pd/C or Pd/MgF₂ was doped. In the
case of Au addition to 2 weight% Pd/MgF₂, the selectivity for CH₂F₂ was
considerably enhanced, from .apprx.72 to 86%, whereas analogous

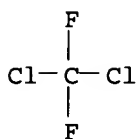
modification of 1 weight% Pd/C caused only insignificant changes. TPR and XRD studies of the **catalysts** indicated considerable differences in the extent of the homogeneity of the Pd-Au bimetal; the degree of alloying was substantially higher for the former **catalyst**. This suggests that an intimate contact between Pd and Au is essential for improving the selectivity for CH₂F₂. XRD of spent **catalysts** showed C incorporation into a Pd lattice. A majority of this C can be removed by a short H₂ purge at 200°.

IT 75-71-8, CFC 12

RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrodechlorination of dichlorodifluoromethane (CFC-12) by carbon- and MgF₂-supported palladium and palladium-gold **catalysts**)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-10-5P, Difluoromethane

RL: SPN (Synthetic preparation); PREP (Preparation)
(hydrodechlorination of dichlorodifluoromethane (CFC-12) by carbon- and MgF₂-supported palladium and palladium-gold **catalysts**)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 29 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2000:494704 HCAPLUS

DOCUMENT NUMBER: 133:209600

TITLE: Microwave irradiation: an effective method for the preparation of low dispersed Pd/Al₂O₃ **catalysts** used in the hydrodechlorination of CCl₂F₂ to CH₂F₂

AUTHOR(S): Prasad, P. S. Sai; Lingaiah, N.; Chandrasekhar, S.; Rao, K. S. Rama; Rao, P. Kanta; Raghavan, K. V.; Berry, F. J.; Smart, L. E.

CORPORATE SOURCE: Catalysis and Physical Chemistry Division, Indian Institute of Chemical Technology, Hyderabad, 500 007, India

SOURCE: Catalysis Letters (2000), 66(4), 201-204
CODEN: CALEER; ISSN: 1011-372X

PUBLISHER: Baltzer Science Publishers

DOCUMENT TYPE: Journal

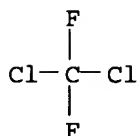
LANGUAGE: English

AB Microwave irradiation is used to prepare low dispersed Pd/Al₂O₃ **catalysts** with high activity and selectivity to CH₂F₂ in the hydrodechlorination of CCl₂F₂.

IT 75-10-5P, HFC 32
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (microwave irradiation in preparation of low dispersed Pd/Al₂O₃
catalysts for CCl₂F₂ hydrodechlorination to CH₂F₂)
 RN 75-10-5 HCAPLUS
 CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

IT 75-71-8, CFC 12
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (microwave irradiation in preparation of low dispersed Pd/Al₂O₃
catalysts for CCl₂F₂ hydrodechlorination to CH₂F₂)
 RN 75-71-8 HCAPLUS
 CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 30 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2000:361318 HCAPLUS

DOCUMENT NUMBER: 133:152239

TITLE: **Hydrodechlorination of**
Dichlorodifluoromethane over Palladium Model
Catalysts and a Comparison with the
Hydrodechlorination of 1,1-
 Dichlorotetrafluoroethane

AUTHOR(S): Ramos, Andre L. D.; Schmal, Martin; Aranda, Donato A.
 G.; Somorjai, Gabor A.

CORPORATE SOURCE: Department of Chemistry, and Materials Sciences
 Division, Lawrence Berkeley National Laboratory,
 University of California, Berkeley, CA, 94720-1460,
 USA

SOURCE: Journal of Catalysis (2000), 192(2), 423-431
 CODEN: JCTLA5; ISSN: 0021-9517

PUBLISHER: Academic Press

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The **hydrodechlorination** of CCl₂F₂ (CFC-12)
 was performed on small surface area model **catalysts**, including
 Pd(111) and Pd(110) single crystals and polycryst. Pd foil. The reactions
 were performed in a batch reactor at atmospheric pressure and 423-523 K. The
 main products were CH₂F₂ and CH₄. Ethane was detected at higher temps.
 Lower deactivation rates and higher activation energy for CH₂F₂ formation
 were achieved with Pd(111). In a comparison with
 dichlorotetrafluoroethane **hydrodechlorination**, the rate of
 CFC-12 dechlorination was 2 orders of magnitude lower,
 the mono-dechlorinated product (CHClF₂) was not produced, and the bulk Pd
 hydrogen activity was not detected. (c) 2000 Academic Press.

IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); PREP (Preparation)
 (hydrodechlorination of CCl₂F₂ to CH₂F₂ over crystalline Pd
 catalysts)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

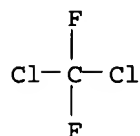
F-CH₂-F

IT 75-71-8, Dichlorodifluoromethane

RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC
 (Process); RACT (Reactant or reagent)
 (hydrodechlorination of CCl₂F₂ to CH₂F₂ over crystalline Pd
 catalysts)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 31 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:652224 HCAPLUS

DOCUMENT NUMBER: 131:302890

TITLE: Conversion under hydrogen of
 dichlorodifluoromethane and
 chlorodifluoromethane over nickel catalysts

AUTHOR(S): Morato, A.; Alonso, C.; Medina, F.; Salagre, P.;
 Sueiras, J. E.; Terrado, R.; Giralt, A.

CORPORATE SOURCE: Escola Tecnica Superior d'Enginyeria Quimica,
 Universitat Rovira i Virgili, Tarragona, Spain

SOURCE: Applied Catalysis, B: Environmental (1999), 23(2-3),
 175-185

CODEN: ACBEE3; ISSN: 0926-3373

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB We have studied the conversion of CFC-12 and HCFC-22
 with hydrogen between 523 and 563 K at atmospheric pressure, over Ni,
 graphite-supported Ni (NiGr), activated-carbon-supported Ni (NiAC),
 Ni-potassium oxide (NiKAC), Ni-copper (NiCuAC) and Ni-aluminum
 oxide (NiAlAC) catalysts reduced at 623 K. Bulk nickel, NiAC,
 and NiAlAC catalysts suffered an increase in activity during the
 first 15 h on stream, while NiGr, NiCuAC and NiKAC suffered a decrease in
 activity during this first period for the hydrodehalogenation reaction of
 HCFC-22. The bulk nickel catalyst showed the highest activity,
 measured as TOF, for the conversion of CFC-12 and
 HCFC-22 with hydrogen. This could be due to the different morphol. of the
 nickel particles for this catalyst. During this first 15 h on
 stream, metal nickel phase is totally transformed into nickel carbide only
 for the NiAlAC catalyst. The new Ni₃C phase seems to be more
 active than the nickel phase for the hydroconversion of CFC-

12 and HCFC-22. This Ni₃C phase has not been detected by XRD for the other **catalysts**. However, their formation at the surface level is not excluded. The best hydrodehalogenation reactions are those which first allow the removal of one chlorine atom during one sojourn on the surface of the **catalysts**, and then allow the removal of two new halogen atoms. More dimerization compds. are also obtained as products, mainly for the **hydrodechlorination** of **CFC-12**. These dimerization reactions strongly compete with the hydrodehalogenation reaction with nickel **catalysts**. We propose a consecutive mechanism for the hydrogenation of **CFC-12** and HCFC-22 using nickel **catalysts**.

IT 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (activated; conversion under hydrogen of
dichlorodifluoromethane and chlorodifluoromethane over nickel
catalysts containing)
 RN 7440-44-0 HCAPLUS
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

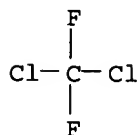
IT 7440-02-0, Nickel, uses
 RL: CAT (Catalyst use); USES (Uses)
 (conversion under hydrogen of **dichlorodifluoromethane** and
 chlorodifluoromethane over nickel **catalysts**)
 RN 7440-02-0 HCAPLUS
 CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

IT 75-10-5, **Difluoromethane**
 RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
 (conversion under hydrogen of **dichlorodifluoromethane** and
 chlorodifluoromethane over nickel **catalysts**)
 RN 75-10-5 HCAPLUS
 CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

IT 75-71-8, **Cfc 12**
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (conversion under hydrogen of **dichlorodifluoromethane** and
 chlorodifluoromethane over nickel **catalysts**)
 RN 75-71-8 HCAPLUS
 CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 47 THERE ARE 47 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 32 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 1999:502941 HCAPLUS
 DOCUMENT NUMBER: 131:215830
 TITLE: **Hydrodechlorination of CFC-12** over fluorinated Pd/Al₂O₃ **catalyst**
 AUTHOR(S): Jeon, Sang Gu; Shul, Yong Gun; Lee, Hyunjo; Ahn, Byoung Sung
 CORPORATE SOURCE: CFC Alternative Research Center, Korea Institute of Science and Technology, Seoul, S. Korea
 SOURCE: Hwahak Konghak (1999), 37(1), 103-107
 CODEN: HHKHAT; ISSN: 0304-128X
 PUBLISHER: Korean Institute of Chemical Engineers
 DOCUMENT TYPE: Journal
 LANGUAGE: Korean

AB The **hydrodechlorination** of CFC-12 (CF₂Cl₂) was studied using fluorinated Pd/Al₂O₃ **catalysts**. The **catalysts** were fluorinated by using HCFC-22 (CHF₂Cl) or reduced by H before the reaction. They were characterized by BET, XRD and TEM before and after reaction. The activity and selectivity to **HFC-32** (CH₂F₂) of the 2 **catalysts** were compared. The fluorinated **catalyst** gave better performance.

IT 1344-28-1, Alumina, uses
 RL: CAT (Catalyst use); USES (Uses)
 (**hydrodechlorination** of CFC-12 to CH₂F₂ over fluorinated Pd/Al₂O₃ **catalyst**)

RN 1344-28-1 HCAPLUS

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT 75-10-5P, **HFC-32**
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (**hydrodechlorination** of CFC-12 to CH₂F₂ over fluorinated Pd/Al₂O₃ **catalyst**)

RN 75-10-5 HCAPLUS

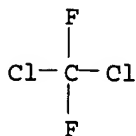
CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

IT 75-71-8, **CFC-12**
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (**hydrodechlorination** of CFC-12 to CH₂F₂ over fluorinated Pd/Al₂O₃ **catalyst**)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



L24 ANSWER 33 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:325854 HCAPLUS
 DOCUMENT NUMBER: 130:353927
 TITLE: Supported **catalyst** for reductive
 dechlorination of chlorofluorocarbons to produce
 fluorocarbons
 INVENTOR(S): Freiberg, Jurgen; Zehl, Gerald; Meinke, Martina
 PATENT ASSIGNEE(S): Gesellschaft zur Beseitigung von Umweltschaden mbH,
 Germany
 SOURCE: PCT Int. Appl., 23 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: German
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9924163	A1	19990520	WO 1998-EP7102	19981106
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
DE 19750789	A1	19990520	DE 1997-19750789	19971106
AU 9912334	A1	19990531	AU 1999-12334	19981106
EP 1051251	A1	20001115	EP 1998-955548	19981106
EP 1051251	B1	20030226		
R: BE, DE, ES, FR, GB, GR, IT, NL				
TW 542751	B	20030721	TW 1998-87118492	19990127
PRIORITY APPLN. INFO.:			DE 1997-19750789	A 19971106
			WO 1998-EP7102	W 19981106

OTHER SOURCE(S): MARPAT 130:353927

AB A supported **catalyst** for producing fluorocarbons by
 hydrodehalogenating chlorofluorocarbons (CFC's) or halons with hydrogen
 contains a metal composition $Pd_aX_bY_c$ [X = group VIII metal; Y = group III or IV
 or rare-earth metal; $a = 0.5$ to $100-(b+c)$; $b = > 0$ to $100-(a+c)$; $c = > 0$
 to $100-(a+b)$; $b+c \neq 0$]. Thus, a **catalyst** containing Pd 10, Os
 1, Zr 0.5% on activated charcoal was prepared by treating the activated
 charcoal with concentrated HCl at 80° for 4 h, adding the required amts.
 of $PdCl_2$, $OsCl_3$, and $ZrOCl_2$ in 20% HCl and drying the slurry at
 120° for 10 h. The **catalyst** was used to
 hydrodechlorinate CF_2Cl_2 to CH_2F_2 .

IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
 (Preparation)

(supported **catalyst** for reductive dechlorination of
 chlorofluorocarbons to produce fluorocarbons)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

IT 75-71-8, Dichlorodifluoromethane

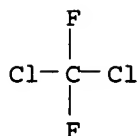
RL: RCT (Reactant); RACT (Reactant or reagent)

(supported **catalyst** for reductive dechlorination of

chlorofluorocarbons to produce fluorocarbons)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 34 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:238116 HCAPLUS

DOCUMENT NUMBER: 131:60279

TITLE: Magnesium fluoride as a catalytic support in hydrodechlorination of CCl₂F₂ (CFC-12)

AUTHOR(S): Malinowski, A.; Juszczak, W.; Pielaszek, J.; Bonarowska, M.; Karpinski, Z.; Wojciechowska, M.
CORPORATE SOURCE: Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, PL-01224, Pol.
SOURCE: Chemical Communications (Cambridge) (1999), (8), 685-686

CODEN: CHCOFS; ISSN: 1359-7345

PUBLISHER: Royal Society of Chemistry

DOCUMENT TYPE: Journal

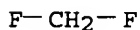
LANGUAGE: English

AB MgF₂-supported Pd and Ru are useful catalysts for hydrodechlorination of CFC-12 to CH₂F₂.
Doping of Pd/MgF₂ with Au increased the selectivity to CH₂F₂ to .apprx.90%.

IT 75-10-5P, Difluoromethane
RL: IMF (Industrial manufacture); PREP (Preparation)
(hydrodechlorination of CFC-12 to CH₂F₂
using Au-promoted Pd/MgF₂ and Ru/MgF₂ catalysts)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



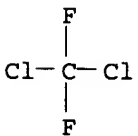
IT 75-71-8, CFC-12

RL: RCT (Reactant); RACT (Reactant or reagent)

(hydrodechlorination of CFC-12 to CH₂F₂
using Au-promoted Pd/MgF₂ and Ru/MgF₂ catalysts)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 35 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:119228 HCAPLUS

DOCUMENT NUMBER: 130:267056

TITLE: **Hydrodechlorination of 1,1-dichlorotetrafluoroethane and dichlorodifluoromethane** catalyzed by Pd on fluorinated aluminas: the role of support material
 AUTHOR(S): Early, Kintu; Kovalchuk, Vladimir I.; Lonyi, Ferenc; Deshmukh, Subodh; d'Itri, Julie L.

CORPORATE SOURCE: Department of Chemical Engineering, University of Pittsburgh, Pittsburgh, PA, 15261, USA

SOURCE: Journal of Catalysis (1999), 182(1), 219-227

CODEN: JCTLA5; ISSN: 0021-9517

PUBLISHER: Academic Press

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Gas-phase **hydrodechlorination** of CF₃CFCl₂ (I) to CF₃CH₂F and CF₂Cl₂ to CH₂F₂ catalyzed by Pd supported on Al₂O₃, a series of fluorinated Al₂O₃, and AlF₃ was studied. A combination of reaction kinetics studies and characterization by in situ FTIR spectroscopy was used. For reactions involving I, all **catalysts** exhibit a rapid and significant decrease in activity; however, little change in activity with time on stream occurs with CF₂Cl₂. FTIR studies suggest the occurrence of a direct reaction between the CFC and the support material, which results in the consumption of OH groups during the early stages of reaction. The effect of fluorination of the support on catalytic behavior of Pd is discussed. (c) 1999 Academic Press.

IT 1344-28-1D, Alumina, fluorinated

RL: CAT (Catalyst use); USES (Uses)

(role of support material in **hydrodechlorination** of dichlorotetrafluoroethane and -difluoromethane catalyzed by palladium on fluorinated aluminas)

RN 1344-28-1 HCAPLUS

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

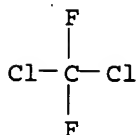
IT 75-71-8, **Dichlorodifluoromethane**

RL: RCT (Reactant); RACT (Reactant or reagent)

(role of support material in **hydrodechlorination** of dichlorotetrafluoroethane and -difluoromethane catalyzed by palladium on fluorinated aluminas)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 36 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1998:506925 HCAPLUS
 DOCUMENT NUMBER: 129:177179
 TITLE: Pd-Re/Al₂O₃: characterization and catalytic activity in **hydrodechlorination** of CCl₂F₂
 AUTHOR(S): Malinowski, A.; Juszczak, W.; Bonarowska, M.; Pielaszek, J.; Karpinski, Z.
 CORPORATE SOURCE: Department of Catalysis on Metals, Institute of Physical Chemistry of the Polish Academy of Sciences, Warsaw, 01-224, Pol.
 SOURCE: Journal of Catalysis (1998), 177(2), 153-163
 CODEN: JCTLA5; ISSN: 0021-9517
 PUBLISHER: Academic Press
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB A series of Pd-Re/Al₂O₃ **catalysts** were prepared and characterized using x-ray diffraction, chemisorption, and temperature-programmed methods.

The **catalysts** were evaluated for **hydrodechlorination** of CCl₂F₂. Adding Re to Pd/Al₂O₃ introduces substantial changes in catalytic behavior. All Pd-Re bimetallic samples strongly deactivated with time-onstream, whereas the activity of Pd/Al₂O₃, after an initial increase, was fairly stable. Selectivity patterns for the bimetallic samples also differed from that of Pd, showing an increase in selectivity to CH₄ during the stabilization period. The steady-state activity of Pd-rich (≤25 at% Re) bimetallic samples was much lower than that of Pd; however, it increased slightly with further Re addition, reaching a mild maximum at 50 at% Re. The selectivity towards CH₂F₂ changed only slightly with the bimetallic composition (c) 1998 Academic Press.

IT 75-10-5P, **Difluoromethane**

RL: IMF (Industrial manufacture); PREP (Preparation)
 (activity and selectivity of Pd-Re/Al₂O₃ **catalysts** for **hydrodechlorination** of CCl₂F₂ to CH₂F₂)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

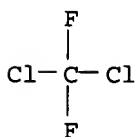
F—CH₂—F

IT 75-71-8, **Dichlorodifluoromethane**

RL: RCT (Reactant); RACT (Reactant or reagent)
 (activity and selectivity of Pd-Re/Al₂O₃ **catalysts** for **hydrodechlorination** of CCl₂F₂ to CH₂F₂)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 55 THERE ARE 55 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 37 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1997:797723 HCAPLUS

DOCUMENT NUMBER: 128:101705

TITLE: **Hydrodechlorination of CCl₂F₂(CFC-12) over γ -alumina supported palladium catalysts**

AUTHOR(S): Juszczyk, W.; Malinowski, A.; Karpinski, Z.

CORPORATE SOURCE: Institute of Physical Chemistry, Department of Catalysis on Metals, Polish Academy of Sciences, ul. Kasprzaka 44/52, 01-224 Warszawa, Pol.

SOURCE: Applied Catalysis, A: General (1998), 166(2), 311-319
CODEN: ACAGE4; ISSN: 0926-860X

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Alumina displays low catalytic activity at the initial stage of the reaction of CCl₂F₂ with hydrogen, giving mainly halogen exchange products, and this activity quickly decays with time-onstream. In the case of Pd/Al₂O₃ **catalysts**, the contribution of the support is negligible at 180°C. Catalytic activity of Pd/ γ -Al₂O₃ in CCl₂F₂ **hydrodechlorination** strongly depends on metal dispersion: poorly dispersed Pd samples exhibit the highest turnover frequencies. The same samples also show the highest selectivities towards the formation of CH₂F₂. Time-onstream behavior and considerable amts. of carbon found in used **catalysts** suggest that the catalytic properties of Pd/Al₂O₃ are regulated by incorporation of carbon into Pd lattice, or the formation of Pd carbide. Poorly dispersed Pd **catalysts** contain a higher proportion of plane atoms and, therefore, are subjected to a more severe carbiding. Such a transformation generates surfaces which bind Freon mols. less strongly, resulting in higher activity and selectivity to partial dehalogenation, i.e formation of CH₂F₂. High-temperature reduction at 600° does not much change the overall activity of Pd/Al₂O₃. However, the selectivity to CH₂F₂ is somewhat increased. It is believed that the Pd-Al₂O₃ interface changes upon high-temperature reduction, leading

to a

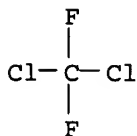
Pd-Al compound At corrosive conditions of hydrodehalogenation of CCl₂F₂, the Pd-Al would be converted to AlF_x species much more easily than the Al₂O₃ species at the Pd-Al₂O₃ interface of mildly reduced Pd/Al₂O₃ **catalysts**.

IT 75-71-8, CFC-12

RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrodechlorination of CCl₂F₂(CFC-12)
over γ -alumina supported palladium **catalysts**)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-10-5P, Difluoromethane

RL: SPN (Synthetic preparation); PREP (Preparation)
(hydrodechlorination of CCl₂F₂(CFC-12)
over γ -alumina supported palladium **catalysts**)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 38 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1997:639474 HCAPLUS

DOCUMENT NUMBER: 127:294912

TITLE: **Hydrodechlorination of CF₂Cl₂ (CFC-12) on Pd/Al₂O₃ catalysts**

AUTHOR(S): Juszczyk, W.; Malinowski, A.; Bonarowska, M.; Karpinski, Z.

CORPORATE SOURCE: Department of Catalysis on Metals, Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, 01-224, Pol.

SOURCE: Polish Journal of Chemistry (1997), 71(9), 1314-1320
CODEN: PJCHDQ; ISSN: 0137-5083

PUBLISHER: Polish Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The hydro-dechlorination of CF₂Cl₂ was studied in the presence of dispersed alumina-supported palladium **catalysts**. The catalytic activity of α-Al₂O₃- and γ-Al₂O₃-supported palladium was comparable, however, palladium supported on α-Al₂O₃ appeared to be more selective towards CF₂H₂ than Pd/γ-Al₂O₃. Since α-Al₂O₃ is markedly less porous than γ-Al₂O₃, lower selectivity towards partial hydro-dehalogenation on Pd/γ-Al₂O₃ may result from a consecutive reaction of CF₂H₂ to methane. High temperature pretreatment eliminated narrow pores in γ-Al₂O₃, leading to higher selectivity to CF₂H₂. Carbonization deposits on the palladium surface during the reaction, but the **catalyst** can be re-activated by removal of the deposits, to a level equal to that of fresh **catalyst**.

IT 75-10-5P, Difluoromethane

RL: PNU (Preparation, unclassified); PREP (Preparation)

(**hydrodechlorination of CF₂Cl₂ on Pd/Al₂O₃ catalysts**

and effect of alumina phase on activity and selectivity of system)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

F-CH₂-F

IT 75-71-8, CFC-12

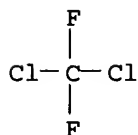
RL: RCT (Reactant); RACT (Reactant or reagent)

(**hydrodechlorination of CF₂Cl₂ on Pd/Al₂O₃ catalysts**

and effect of alumina phase on activity and selectivity of system)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 1344-28-1, Alumina, uses
 RL: CAT (Catalyst use); USES (Uses)
 (α and γ phases; **hydrodechlorination** of CF_2Cl_2 on
 $\text{Pd}/\text{Al}_2\text{O}_3$ **catalysts** and effect of alumina phase on activity
 and selectivity of system)
 RN 1344-28-1 HCAPLUS
 CN Aluminum oxide (Al_2O_3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 39 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1996:201270 HCAPLUS

DOCUMENT NUMBER: 124:342345

TITLE: A study on the **hydrodechlorination** reaction
 of **dichlorodifluoromethane** over Pd/AlF_3
catalyst

AUTHOR(S): Ahn, Byoung Sung; Lee, Sang Cheol; Moon, Dong Ju; Lee,
 Byung Gwon

CORPORATE SOURCE: CFC Alternatives Technology Center, Korea Institute of
 Science and Technology, P.O.Box 131, Cheongryang,
 Seoul, S. Korea

SOURCE: Journal of Molecular Catalysis A: Chemical (1996),
 106(1-2), 83-91

CODEN: JMCCF2; ISSN: 1381-1169

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

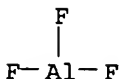
LANGUAGE: English

AB The **hydrodechlorination** reaction of
dichlorodifluoromethane (CF_2Cl_2) has been studied under an atmospheric
 pressure at 130-210° over Pd/AlF_3 **catalyst**. The effects
 of various reaction conditions on the **catalyst** performance in
 terms of the reaction rate and product distributions were extensively
 investigated and the adsorption behaviors of H_2 , CF_2Cl_2 , CHF_2Cl , CH_2F_2 and
 CH_3F on the **catalyst** surface are compared. In addition, the
 plausible reaction scheme has been proposed based on the exptl.
 observations. Under the assumption that the formation of two main
 products, CH_2F_2 and CH_4 , proceeds through the hydrogenation of
 intermediate species, CF_2 , the reaction rate consts. have been calculated by
 fitting the exptl. data with the reaction rate expression.

IT 7784-18-1, Aluminum trifluoride
 RL: CAT (Catalyst use); USES (Uses)
 (**hydrodechlorination** of **dichlorodifluoromethane**
 over Pd/AlF_3 **catalyst**)

RN 7784-18-1 HCAPLUS

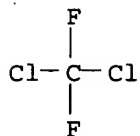
CN Aluminum fluoride (AlF_3) (9CI) (CA INDEX NAME)



IT 75-71-8, Dichlorodifluoromethane
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT
 (Reactant); PROC (Process); RACT (Reactant or reagent)
 (**hydrodechlorination** of **dichlorodifluoromethane**
 over Pd/AlF_3 **catalyst**)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-10-5P, Difluoromethane

RL: SPN (Synthetic preparation); PREP (Preparation)
(hydrodechlorination of dichlorodifluoromethane
over Pd/AlF₃ catalyst)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



L24 ANSWER 40 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1995:690280 HCAPLUS

DOCUMENT NUMBER: 123:111543

TITLE: Process and carbide catalysts for the
hydrodechlorination of chloromethanes

INVENTOR(S): Sherif, Fawzy G.

PATENT ASSIGNEE(S): Akzo Nobel NV, Neth.

SOURCE: U.S., 4 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5426252	A	19950620	US 1993-138291	19931015
PRIORITY APPLN. INFO.:			US 1993-138291	19931015

OTHER SOURCE(S): CASREACT 123:111543

AB Chloromethanes (e.g., CCl₄, etc.) and chlorofluoromethanes (e.g., Cl₂CF₂, etc.) are **hydrodechlorinated** (e.g., in the case of Cl₂CF₂ to CHClF₂ and/or H₂CF₂) by treatment with H₂ in the presence of a transition metal carbide **catalyst** (e.g., Group IVB metal carbides; W carbide) supported on a metal oxide (e.g., alumina optionally with a passivating layer of a ceramic such as Si carbide between the oxide support and **catalyst**). The **catalyst** preferably has a surface area of ≥1 m²/g.

IT 75-10-5P, Difluoromethane

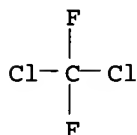
RL: IMF (Industrial manufacture); PREP (Preparation)
(process and carbide catalysts for the
hydrodechlorination of chloromethanes)

RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)



IT 75-71-8, Dichlorodifluoromethane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (process and carbide **catalysts** for the
hydrodechlorination of chloromethanes)
 RN 75-71-8 HCAPLUS
 CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



IT 1344-28-1, Alumina, uses
 RL: CAT (Catalyst use); USES (Uses)
 (supports; **catalysts** for **hydrodechlorination** of
 chloromethanes)
 RN 1344-28-1 HCAPLUS
 CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

L24 ANSWER 41 OF 41 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1993:625415 HCAPLUS

DOCUMENT NUMBER: 119:225415

TITLE: Conversion under hydrogen of
dichlorodifluoromethane over bimetallic
 palladium **catalysts**

AUTHOR(S): Coq, Bernard; Hub, Serge; Figueras, Francois;
 Tournigant, Didier

CORPORATE SOURCE: Laboratoire de Chimie Organique Physique et Cinetique
 Chimique Appliquees, URA 418 CNRS; ENSCM, 8 rue de
 l'Ecole Normale, Montpellier, 34053, Fr.

SOURCE: Applied Catalysis, A: General (1993), 101(1), 41-50
 CODEN: ACAGE4; ISSN: 0926-860X

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 119:225415

AB The conversion of **difluorodichloromethane** under hydrogen has
 been studied in the gas phase between 413 and 473 K at atmospheric pressure
 over

graphite supported Pd, PdK, PdFe, PdCo and PdAg **catalysts**
 reduced at 523 K. Neither a stoichiometric phase, nor a solid solution was
 detected in these **catalysts**. In CF₂Cl₂ hydrogenation at low
 CF₂Cl₂ pressure (P(CF₂Cl₂)/P(H₂)<0.3), CH₂F₂ and CH₄ represent more than
 95% of the products. However, at high CF₂Cl₂ pressure
 (P(CF₂Cl₂)/P(H₂)>2), and over PdFe/graphite or PdCo/graphite
catalysts, high selectivities for the coupling product CF₂CF₂ were
 obtained. This is probably due to the occurrence of some mixed sites
 between Pd and Fe or Co. The kinetics of the reaction indicates
 adsorption competition between CF₂Cl₂ and H₂ for the active sites, which
 can be described by an halogenation/dehalogenation mechanism of the
 palladium surface by CF₂Cl₂ and hydrogen resp.

IT 75-10-5P, Difluoromethane
 RL: FORM (Formation, nonpreparative); PREP (Preparation)
 (formation of, via catalytic **hydrodechlorination** of
difluorodichloromethane)
 RN 75-10-5 HCAPLUS

CN Methane, difluoro- (8CI, 9CI) (CA INDEX NAME)

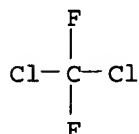
F-CH₂-F

IT 75-71-8, Difluorodichloromethane

RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrodechlorination of, catalysts for)

RN 75-71-8 HCAPLUS

CN Methane, dichlorodifluoro- (8CI, 9CI) (CA INDEX NAME)



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L1	12	SEA FILE=REGISTRY	ABB=ON	PLU=ON	CCL2F2/MF
L2	11	SEA FILE=REGISTRY	ABB=ON	PLU=ON	CH2F2/MF
L3	1	SEA FILE=REGISTRY	ABB=ON	PLU=ON	DICHLORODIFLUOROMETHANE/CN
L4	1	SEA FILE=REGISTRY	ABB=ON	PLU=ON	DIFLUOROMETHANE/CN
L5	2927	SEA FILE=REGISTRY	ABB=ON	PLU=ON	PALLIDUM
L6	219466	SEA FILE=REGISTRY	ABB=ON	PLU=ON	ALUMINUM
L7	667	SEA FILE=REGISTRY	ABB=ON	PLU=ON	CATALYST
L8		SEL PLU=ON L1 1- CHEM :		58	TERMS
L9		SEL PLU=ON L3 1- CHEM :		37	TERMS
L10	11323	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L8
L11	11314	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L9
L12	11323	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L10 OR L11 OR DICHLORODIFLUORO METHAN?
L13		SEL PLU=ON L2 1- CHEM :		30	TERMS
L14		SEL PLU=ON L4 1- CHEM :		11	TERMS
L15	3844	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L13
L16	3816	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L14
L17	3971	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L15 OR L16 OR DIFLUOROMETHAN?
L18	519	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L12 AND L17
L19	2374	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L5 OR PALLIDUM?
L20	1176747	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L6 OR ALUMINUM?
L21	1845904	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L7 OR CATALYST
L22	127	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L18 AND (L19 OR L20 OR L21)
L23	41	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L18 AND ?HYDRODECHLORIN?
L24	41	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L22 AND L23
L25	878	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L12 (L) (RCT/RL OR RACT/RL)
L26	114	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L25 AND L17
L27	571	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L12 (L) (HYDRODECHLORIN? OR L19 OR L20 OR L21)
L28	66	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L26 AND L27
L29	32	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L28 NOT L24

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L29 ANSWER 1 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:90386 HCAPLUS

DOCUMENT NUMBER: 140:359268

TITLE: Dehalogenative oligomerization of
dichlorodifluoromethane catalyzed by activated
 carbon-supported Pt-Cu **catalysts**: effect of
 Cu to Pt atomic ratio

AUTHOR(S): Chakraborty, Debasish; Kulkarni, Parag P.; Kovalchuk,
 Vladimir I.; d'Itri, Julie L.

CORPORATE SOURCE: Department of Chemical Engineering, University of
 Pittsburgh, Pittsburgh, PA, 15261, USA

SOURCE: Catalysis Today (2004), 88(3-4), 169-181

CODEN: CATTEA; ISSN: 0920-5861

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Activated carbon-supported Pt-Cu catalysts with a Cu to Pt atomic ratio in the range of 2-18 catalyze the formation of oligomerization hydrocarbon products from an equimolar mixture of CF₂Cl₂ and H₂ at 523 K. The steady-state selectivity toward C₂+ products is 42% for the Pt₁Cu₂/C and increases to more than 70% when the Cu/Pt atomic ratio reaches 18:1. All catalysts deactivate with time on stream. The results of the TEM investigation are consistent with the suggestion that deactivation is attributed to carbon deposition and not to particle sintering. All of the catalysts have approx. the same average size of Pt-containing particles, independent of Cu/Pt atomic ratio, and the average size is essentially the same for the freshly reduced and used Pt-Cu catalysts. As the Cu to Pt atomic ratio is increased, a larger fraction of Cu is unalloyed with Pt. The performance of the catalysts in the CF₂Cl₂ + H₂ reaction is discussed in terms of the different active sites, which catalyze different elementary reaction steps.

IT 7440-44-0, BPL F3, uses

RL: CAT (Catalyst use); USES (Uses)

(activated, support; effect of Cu to Pt atomic ratio on dehalogenative oligomerization of **dichlorodifluoromethane** catalyzed by activated carbon-supported Pt-Cu **catalysts**)

IT 16941-12-1, Platinic acid (H₂PtCl₆)

RL: CAT (Catalyst use); USES (Uses)

(effect of Cu to Pt atomic ratio on dehalogenative oligomerization of **dichlorodifluoromethane** catalyzed by activated carbon-supported Pt-Cu **catalysts**)

IT 75-10-5, Difluoromethane

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)

(effect of Cu to Pt atomic ratio on dehalogenative oligomerization of **dichlorodifluoromethane** catalyzed by activated carbon-supported Pt-Cu **catalysts**)

IT 75-71-8, Dichlorodifluoromethane

RL: RCT (Reactant); RACT (Reactant or reagent)

(effect of Cu to Pt atomic ratio on dehalogenative oligomerization of **dichlorodifluoromethane** catalyzed by activated carbon-supported Pt-Cu **catalysts**)

REFERENCE COUNT: 72 THERE ARE 72 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 2 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2003:926816 HCAPLUS

DOCUMENT NUMBER: 140:198917
 TITLE: Conversion of dichlorodifluoromethane with hydrogen over Pd/AlF₃ and Ru/AlF₃ prepared by sol-gel method
 AUTHOR(S): Hina, Rateb H.; Al-Fayyoumi, Rasha Kh.
 CORPORATE SOURCE: Department of Chemical Sciences, Jordan University of Science & Technology, Irbid, 22110, Jordan
 SOURCE: Journal of Molecular Catalysis A: Chemical (2004), 207(1), 27-33
 CODEN: JMCCF2; ISSN: 1381-1169
 PUBLISHER: Elsevier Science B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB The reaction of **dichlorodifluoromethane** and H was studied in the gas phase at temps. 438-538 K and atmospheric pressure over Pd and Ru supported AlF₃ **catalysts** prepared by sol-gel method. For the hydrogenation of CF₂Cl₂, CH₂F₂ and CH₄ represented >97% of the products. The catalytic properties of the **catalysts** are unchanged with time and they showed no significant difference in their activities. At the steady state, the kinetics of the reaction described by a mechanism of a halogenation/dehalogenation of the Pd and Ru surfaces by CF₂Cl₂ and H₂, resp. The values of the resp. rate consts. were then determined At 448 K, the interaction between the Pd and Ru surfaces with CF₂Cl₂ or H₂ is of the same order of magnitude. The conversion ratio on Ru/Pd supported **catalysts** within the temperature range used was increased from 1.5 to 4.1, while the selectivity of CH₂F₂/CH₄ ratio was decreased from .apprx.17.4 to 1.8 on the surfaces of both **catalysts**. This leads to the proposition that the high dispersion of Pd and Ru over the support are responsible for the high activity and high selectivity in CH₂F₂.

IT 75-71-8, **Dichlorodifluoromethane**

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process);
 RACT (Reactant or reagent)

(conversion of **dichlorodifluoromethane** with hydrogen over Pd/AlF₃ and Ru/AlF₃ prepared by sol-gel method)

IT 75-10-5P, **Difluoromethane**

RL: SPN (Synthetic preparation); PREP (Preparation)

(conversion of dichlorodifluoromethane with hydrogen over Pd/AlF₃ and Ru/AlF₃ prepared by sol-gel method)

IT 7784-18-1, **Aluminum fluoride (AlF₃)**

RL: CAT (Catalyst use); USES (Uses)

(support; conversion of **dichlorodifluoromethane** with hydrogen over Pd/AlF₃ and Ru/AlF₃ prepared by sol-gel method)

REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 3 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:197505 HCAPLUS

DOCUMENT NUMBER: 137:21727

TITLE: Novel calcined Mg-Cr hydrotalcite supported Pd catalysts for the hydrogenolysis of CCl₂F₂

AUTHOR(S): Padmasri, A. H.; Venugopal, A.; Krishnamurthy, J.; Rama Rao, K. S.; Kanta Rao, P.

CORPORATE SOURCE: Catalysis and Physical Chemistry Division, Indian Institute of Chemical Technology, Hyderabad, 500 007, India

SOURCE: Journal of Molecular Catalysis A: Chemical (2002), 181(1-2), 73-80

CODEN: JMCCF2; ISSN: 1381-1169

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal
 LANGUAGE: English

AB Pd supported on calcined Mg-Cr hydrotalcite, MgO and Cr₂O₃ are prepared and tested for the hydrogenolysis of CCl₂F₂. It was found that 6% Pd loading is optimum on MgO-Cr₂O₃ hydrotalcite. The hydrogenolysis activities for CCl₂F₂ are found in the order: Pd/HT>Pd/MgO>Pd/Cr₂O₃, while Pd/HT was yielding deep hydrogenation product (CH₄) with more selectivity, Pd/MgO is yielding dechlorination product (CH₂F₂) and Pd/Cr₂O₃ was showing poor activity. It was observed that calcined Mg-Cr hydrotalcite has shown synergy when used as a support for Pd and used for the hydrogenolysis of CCl₂F₂.

IT 75-71-8, Dichlorodifluoromethane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (calcined Mg-Cr hydrotalcite supported Pd catalysts for CCl₂F₂ hydrogenolysis)

IT 75-10-5P, Difluoromethane
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (calcined Mg-Cr hydrotalcite supported Pd catalysts for CCl₂F₂ hydrogenolysis)

REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 4 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:22682 HCAPLUS
 DOCUMENT NUMBER: 136:75214
 TITLE: Characterization and Reactivity of Pd/MgO and Pd/ γ -Al₂O₃ Catalysts in the Selective Hydrogenolysis of CCl₂F₂

AUTHOR(S): Aytam, Hari Padmasri; Akula, Venugopal; Janmanchi, Krishnamurthy; Rama Rao, Kamaraju Seetha; Rao, Panja Kanta; Gurram, Kishan; Niemantsverdriet, J. W.

CORPORATE SOURCE: Catalysis and Physical Chemistry Division, Indian Institute of Chemical Technology, Hyderabad, 500 007, India

SOURCE: Journal of Physical Chemistry B (2002), 106(5), 1024-1031
 CODEN: JPCBPK; ISSN: 1089-5647

PUBLISHER: American Chemical Society
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB Al₂O₃ and MgO supported Pd catalysts with 6 wt % loading are prepared by the wet impregnation method. The catalysts are made into two parts; one of them is dried at 110 °C, and the other one is calcined at 500 °C. Conversion of CCl₂F₂ in hydrogen is carried out under identical reaction conditions on both dried and calcined catalysts after the catalysts are prereduced in H₂ at 400 °C for 3h. The fresh and the used catalysts are characterized by BET-surface area, X-ray diffraction (XRD), temperature programmed reduction (TPR), temperature programmed desorption (TPD) of NH₃, and XPS. XPS data shows that surface Pd species are more in MgO supported catalyst than in Al₂O₃ supported one. In used catalysts, surface F- concentration is more on MgO than on Al₂O₃ supported Pd catalyst. The MgO supported Pd catalyst (dried) showed higher reactivity and CH₂F₂ selectivity compared to other catalysts. MgO support is found to be superior to Al₂O₃ support for Pd for the reaction.

IT 75-71-8, Dichlorodifluoromethane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (characterization and reactivity of Pd/MgO and Pd/ γ -Al₂O₃ catalysts in the selective hydrogenolysis of CCl₂F₂)

IT 75-10-5P, Difluoromethane
 RL: SPN (Synthetic preparation); PREP (Preparation)

(characterization and reactivity of Pd/MgO and Pd/ γ -Al₂O₃
catalysts in the selective hydrogenolysis of CCl₂F₂)

REFERENCE COUNT: 44 THERE ARE 44 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 5 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2001:400082 HCAPLUS

DOCUMENT NUMBER: 135:124107

TITLE: Catalytic hydrogenolysis of **CFC-12**
(CCl₂F₂) over Pd **catalyst** supported on
activated carbon treated with alkali and acids
AUTHOR(S): Park, Young-Ho; Moon, Dong Ju; Ahn, Byoung Sung; Park,
Kun You

CORPORATE SOURCE: Korea Institute of Science and Technology, CFC
Alternatives Research Center, Seoul, S. Korea

SOURCE: Hwahak Konghak (2000), 38(5), 585-590

CODEN: HHKHAT; ISSN: 0304-128X

PUBLISHER: Korean Institute of Chemical Engineers

DOCUMENT TYPE: Journal

LANGUAGE: Korean

AB Catalytic hydrogenolysis reaction of **CFC-12** (CCl₂F₂)
was investigated over Pd **catalysts** supported on the activated
carbons which were pretreated with alkali-acid and/or acid-acid in series.
The Pd/C **catalysts** were characterized by ICP, XRD, TEM, N₂
physisorption, and H₂ chemisorption. Minor metal components known as the
side reaction **catalyst** in **CFC-12** catalytic
hydrogenolysis in the activated carbon were removed by consecutive
treatment with NaOH-HCl and/or HCl-HF, HF-HCl. The pretreated Pd/C
catalysts showed higher hydrogenolysis activity and selectivity to
HFC-32 (CH₂F₂) than the corresponding untreated ones.
It was found that the dispersions of the pretreated **catalysts**
were improved and the sintering phenomena were significantly restricted.

IT 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses)
(activated; catalytic hydrogenolysis of **CFC-12**
(CCl₂F₂) over Pd **catalyst** supported on activated carbon
treated with alkali and acids)

IT 75-71-8, **CFC-12**

RL: RCT (Reactant); RACT (Reactant or reagent)
(catalytic hydrogenolysis of **CFC-12** (CCl₂F₂) over
Pd **catalyst** supported on activated carbon treated with alkali
and acids)

IT 75-10-5P, **HFC-32**

RL: SPN (Synthetic preparation); PREP (Preparation)
(catalytic hydrogenolysis of **CFC-12** (CCl₂F₂) over
Pd **catalyst** supported on activated carbon treated with alkali
and acids)

L29 ANSWER 6 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2001:330883 HCAPLUS

DOCUMENT NUMBER: 135:94225

TITLE: Deactivation of palladium on activated carbon in the
selective hydrogenolysis of CCl₂F₂ (**CFC-12**) into CH₂F₂
(**HFC-32**)

AUTHOR(S): Wiersma, A.; van de Sandt, E. J. A. X.; Makkee, M.;
Moulijn, J. A.

CORPORATE SOURCE: Faculty of Applied Sciences, Section of Industrial
Catalysis, Department of Chemical Process Technology,
Delft University of Technology, Delft, 2628 BL, Neth.

SOURCE: Applied Catalysis, A: General (2001), 212(1-2),

223-238
CODEN: ACAGE4; ISSN: 0926-860X
Elsevier Science B.V.

PUBLISHER:
DOCUMENT TYPE:
LANGUAGE:

Journal
English

AB The stability of the selected 1 weight% palladium on activated carbon catalyst in the selective hydrogenolysis of CCl_2F_2 into CH_2F_2 as function of temperature (510-540 K) and hydrogen to CCl_2F_2 feed ratio (1.5-20 mol/mol) has been studied. A satisfactorily stable catalyst performance for at least 1600 h of operation has been obtained at 510 K and H_2 to CCl_2F_2 feed ratios of 6 and 10. Outside this window, significant deactivation of the catalyst was observed. The conversion of CCl_2F_2 and the selectivity for CH_2F_2 were higher at increasing ratio H_2 to CCl_2F_2 ratio. These differences in catalyst performance became more pronounced as a function of time on stream. At higher temps. (520, 525, and 540 K) the catalyst deactivated independent of the H_2 to CCl_2F_2 feed ratio. Addition of methane or CHClF_2 to the feed led to addnl. deactivation of the catalyst, both at lower and higher temps. The observed phenomena of deactivation could be well explained by the formation of carbonaceous deposits on the catalyst surface. Neither sintering nor loss of palladium was found after reaction. On the contrary, the used catalysts had a higher palladium dispersion than the fresh catalyst. The degree of dispersing was dependent of the H_2 to CCl_2F_2 feed ratio and temperature. Poisoning is concluded to be not important. Based on these expts. the operating window of an industrial liquid-cooled multi-tubular CCl_2F_2 hydrogenolysis reactor is defined.

IT 7440-44-0, Carbon, processes
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process);
PROC (Process); USES (Uses)

(deactivation of palladium on activated carbon in the selective
hydrogenolysis of **dichlorodifluoromethane** into
difluoromethane)

IT 75-71-8, CFC 12
RL: RCT (Reactant); RACT (Reactant or reagent)
(deactivation of palladium on activated carbon in the selective
hydrogenolysis of **dichlorodifluoromethane** into
difluoromethane)

IT 75-10-5P, HFC 32
RL: SPN (Synthetic preparation); PREP (Preparation)
(deactivation of palladium on activated carbon in the selective
hydrogenolysis of **dichlorodifluoromethane** into **difluoromethane**
)

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 7 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2000:905514 HCAPLUS

DOCUMENT NUMBER: 134:75572

TITLE: Removal of halogen-containing compound gases from
waste gases

INVENTOR(S): Ueda, Akio; Matsuoka, Nobuhiko; Ichimaru, Hiroshi;
Nakano, Hisaji; Tainaka, Masahiro

PATENT ASSIGNEE(S): Central Glass Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2000354734	A2	20001226	JP 1999-167055	19990614
JP 3565742	B2	20040915		

PRIORITY APPLN. INFO.: JP 1999-167055 19990614

AB The gases are removed by the following steps: (1) treating the waste gases with a solid agent of Si, B, W, Mo, V, or Ge containing catalysts and with oxide gases, e.g., O₂, O₃, N₂O, to form halide gases and (2) treating the halide gases. The catalysts may be Fe, Ni, Al, their oxides, and/or their fluorides. The solid agent may be heated at 100-1000°. The halogen-containing compound gases, e.g., C₅F₈, having low reactivity at normal temperature, are converted to halides, e.g., SiF₄, in the former step and then removed by the latter step by conventional method, e.g., alkali treatment, wet-scrubber treatment.

IT 75-10-5, Difluoromethane 75-71-8,
Dichlorodifluoromethane

RL: POL (Pollutant); RCT (Reactant); REM (Removal or disposal);

OCCU (Occurrence); PROC (Process); RACT (Reactant or reagent)

(removal of halogen compound gases from waste gases by forming halide gases with catalyst-containing solid agents)

L29 ANSWER 8 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2000:362295 HCAPLUS

DOCUMENT NUMBER: 133:152241

TITLE: Selective hydrogenolysis of CCl₂F₂ into CH₂F₂ over palladium on activated carbon Kinetic mechanism and process design

AUTHOR(S): Moulijn, J. A.; Makkee, M.; Wiersma, A.; van de Sandt, E. J. A. X.

CORPORATE SOURCE: Section Industrial Catalysis, Department of Chemical Process Technology, Delft University of Technology, Delft, 2628 BL, Neth.

SOURCE: Catalysis Today (2000), 59(3-4), 221-230

CODEN: CATTEA; ISSN: 0920-5861

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A process-development study is presented for conversion of CCl₂F₂ to CH₂F₂ by hydrogenolysis using Pd/C as catalyst. A kinetic scheme is elucidated and appears to be based on parallel kinetics; one route leads to either CHClF₂ or CH₂F₂ and the other to CH₄. The selectivity to CHClF₂ or CH₂F₂ depends on the amount of adsorbed Cl on the catalytic active surface. If excess H is present, the catalyst is sufficiently stable for a com. process. A conceptual process design is presented.

IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)

(process design for selective hydrogenolysis of CCl₂F₂ to CH₂F₂ over Pd/C)

IT 75-71-8, Dichlorodifluoromethane

RL: PEP (Physical, engineering or chemical process); RCT

(Reactant); PROC (Process); RACT (Reactant or reagent)

(process design for selective hydrogenolysis of CCl₂F₂ to CH₂F₂ over Pd/C)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 9 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2000:109156 HCAPLUS

DOCUMENT NUMBER: 132:213889

TITLE: Electrochemical reduction of dichlorodifluoromethane

at a Nafion solid polymer electrolyte cell

AUTHOR(S): Fotiadis, T.; Kyriacou, G.; Lambrou, C.; Hadjispyrou, S.

CORPORATE SOURCE: Department of Chemical Engineering, Inorganic Chemistry Laboratory, Aristotle University of Thessaloniki, Thessaloniki, Greece

SOURCE: Journal of Electroanalytical Chemistry (2000), 480(1,2), 249-254
CODEN: JECHES; ISSN: 0368-1874

PUBLISHER: Elsevier Science S.A.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The electrochem. reduction of dichlorodifluoromethane (CFC-12) at Ag, Pd, Cu and Au electrodes (which were deposited on Nafion 117 (H⁺ form) membranes, by reduction with NaBH₄ (10% weight/volume) solution) was studied. The products of the reduction were CHClF₂, CH₂F₂, CH₃F and CH₄, as well as small amts. of dimers, CF₂:CF₂ and CHF₂CHF₂. The silver electrode gave the highest current efficiency (CE) and reduction rate. The rate of reduction at the silver electrode was almost 10-160 times higher than that measured for the other electrodes, under the same conditions. Selectivity of CH₄ production increased for all metals with increasing neg. potential, except for CHClF₂ where it decreased. For the other products, a maximum in the selectivity-potential curve appeared. This fact led the authors to the conclusion that the reduction proceeds by the following mechanism: CCl₂F₂ → CHClF₂ → CH₂F₂ → CH₃F → CH₄. The rate of reduction of CFC-12 and the product distribution also depend on the pH of the solution, which is in contact with the membrane. The rate of reduction at the silver electrode was .apprx.4000 times higher at pH 14 than at pH 1. The cation of the supporting electrolyte was also important: the rate of reduction was lowered in the order K⁺ > Na⁺ > Li⁺, and this was attributed to the size of the cations, which influenced the structure of the double layer.

IT 75-71-8, Dichlorodifluoromethane
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
(electrochem. reduction at Ag, Pd, Cu and Au electrodes deposited on Nafion membranes)

IT 75-10-5, Difluoromethane
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(formation in electrochem. reduction of dichlorodifluoromethane at Ag, Pd, and Cu electrodes deposited on Nafion membranes)

REFERENCE COUNT: 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 10 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2000:83709 HCAPLUS

DOCUMENT NUMBER: 132:236693

TITLE: Hydrogenolysis of CFC-12 (CF₂Cl₂) over Pd/γ-Al₂O₃ pretreated with HCFC-22 (CHF₂Cl)

AUTHOR(S): Ahn, B. S.; Jeon, S. G.; Lee, H.; Park, K. Y.; Shul, Y. G.

CORPORATE SOURCE: Korea Institute of Science and Technology, CFC Alternative Research Center, Cheongryang, Seoul, S. Korea

SOURCE: Applied Catalysis, A: General (2000), 193(1,2), 87-93
CODEN: ACAGE4; ISSN: 0926-860X

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The hydrogenolysis of CF₂Cl₂ (CFC-12) has been studied in the gas phase over Pd (3 weight %)/ γ -Al₂O₃. Pretreatment of the catalyst with CHF₂Cl (HCFC-22) was found to significantly improve the catalytic activity and the catalyst lifetime. The formation of Pd-carbide was observed in the CHF₂Cl-treated catalyst, and the presence of the palladium carbide is thought to enhance the selectivity to the CH₂F₂ and to prevent sintering of palladium. XRD, TEM and XPS were used to characterize the structure and the composition of Pd/Al₂O₃.

IT 7784-18-1, Aluminum trifluoride

RL: CAT (Catalyst use); FMU (Formation, unclassified); FORM (Formation, nonpreparative); USES (Uses)

(hydrogenolysis of CFC-12 over Pd/ γ -Al₂O₃ pretreated with HCFC-22)

IT 75-71-8, CFC-12

RL: RCT (Reactant); RACT (Reactant or reagent)

(hydrogenolysis of CFC-12 over Pd/ γ -Al₂O₃ pretreated with HCFC-22)

IT 75-10-5P, HFC-32

RL: SPN (Synthetic preparation); PREP (Preparation)

(hydrogenolysis of CFC-12 over Pd/ γ -Al₂O₃ pretreated with HCFC-22)

IT 1344-28-1, Alumina, uses

RL: CAT (Catalyst use); USES (Uses)

(γ -, catalyst support; hydrogenolysis of CFC-12 over Pd/ γ -Al₂O₃ pretreated with HCFC-22)

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 11 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:781145 HCAPLUS

DOCUMENT NUMBER: 132:224060

TITLE: Development of a palladium on activated carbon for a conceptual process in the selective hydrogenolysis of CCl₂F₂ (CFC-12) into CH₂F₂ (HFC-32)

AUTHOR(S): Makkee, M.; Wiersma, A.; van de Sandt, E. J. A. X.; van Bekkum, H.; Moulijn, J. A.

CORPORATE SOURCE: Section Industrial Catalysis, Delft University of Technology, Department of Chemical Process Technology, Delft, 2628 BL, Neth.

SOURCE: Catalysis Today (2000), 55(1-2), 125-137

CODEN: CATTEA; ISSN: 0920-5861

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The hydrogenolysis of CCl₂F₂ over 1 weight% palladium, platinum, rhodium, ruthenium, iridium, and rhenium on activated carbon has been studied in a micro-flow reactor, in a temperature range of 450-540 K, H₂/CCl₂F₂ feed ratios between 1.5 and 20, a pressure up to 0.4 MPa, and a WHSV between 0.5 and 2 g/(g h). The main products of the reaction for all investigated catalysts were CHClF₂, CH₂F₂, and methane. Palladium on activated carbon shows the highest selectivity to CH₂F₂ (70-90%) at all conversion levels. The activity, selectivity to CH₂F₂, and stability of the palladium catalyst is a strong function of the hydrogen to CFC ratio and methane recycle ratio and the recycling of CHClF₂ is not recommended. The catalyst proves to be stable over a period of 2000 h with simulated recycle streams and an optimum temperature for the catalyst performance was found at 510 K. On the basis of the exptl. data and a kinetic network a conceptual process design was made. In this design no hurdles have been encountered and this waste

technol. looks in economic prospective very promising.

IT 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (activated; HFC-32 production by catalytic
 hydrogenolysis of CFC-12 over carbon-supported
 catalyst)

IT 75-71-8, CFC-12
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (catalytic hydrogenolysis to HFC-32 over
 carbon-supported catalyst)

IT 75-10-5P, HFC-32
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (production by catalytic hydrogenolysis of CFC-12 over
 carbon-supported catalyst)

REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 12 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:730692 HCAPLUS
 DOCUMENT NUMBER: 132:238652
 TITLE: Catalyst deactivation in the selective hydrogenolysis
 of CCl₂F₂ into CH₂F₂
 AUTHOR(S): Wiersma, Andre; Van de Sandt, Emile J. A. X.; Makkee,
 Michiel; Moulijn, Jacob A.
 CORPORATE SOURCE: Section Industrial Catalysis, Delft University of
 Technology, Delft, 2628 BL, Neth.
 SOURCE: Studies in Surface Science and Catalysis (1999),
 126(Catalyst Deactivation 1999), 349-356
 CODEN: SSCTDM; ISSN: 0167-2991
 PUBLISHER: Elsevier Science B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB The stability of 1 wt%Pd/C catalyst for selective hydrogenolysis of CCl₂F₂
 to CH₂F₂ was studied as a function of temperature (510-540K) and H/CCl₂F₂ feed
 ratio (1.5-20 mol/mol). A stable catalyst performance for ≥1600 h
 of operation was attained at 510K and H/CCl₂F₂ feed ratio 6-10. At lower
 ratio (1.5-3), continuous deactivation of the catalyst was observed. At
 H/CCl₂F₂ ratio >20, catalyst deactivation also occurred. Both the
 conversion of CCl₂F₂ and the selectivity to CH₂F₂ were higher with
 increasing H/CCl₂F₂ ratio. The differences in catalyst performance became
 more pronounced as a function of time on stream. The observed phenomena of
 deactivation is explained by the formation of carbonaceous deposits on the
 catalyst surface. Neither sintering nor Pd loss play a role in
 deactivation. On the contrary, the used catalysts have higher Pd
 dispersion than the fresh catalyst.

IT 75-10-5P
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (catalyst deactivation in selective hydrogenolysis of CCl₂F₂ to CH₂F₂
 over Pd/C catalysts)

IT 75-71-8, Dichlorodifluoromethane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (catalyst deactivation in selective hydrogenolysis of CCl₂F₂
 to CH₂F₂ over Pd/C catalysts)

REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 13 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:602280 HCAPLUS
 DOCUMENT NUMBER: 131:206018
 TITLE: Electrochemical reduction of dichlorodifluoromethane

AUTHOR(S): in acetonitrile medium to useful fluorinated compounds
Schizodimou, A.; Kyriacou, G.; Lambrou, Ch.
CORPORATE SOURCE: Department of Chemical Engineering, Aristotle
University of Thessaloniki, Thessaloniki, 54006,
Greece

SOURCE: Journal of Electroanalytical Chemistry (1999), 471(1),
26-31

CODEN: JECHES; ISSN: 0368-1874

PUBLISHER: Elsevier Science S.A.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The electrochem. reduction of dichlorodifluoromethane (CFC-12) at Ag, Cu, Au, Pt and Ni electrodes in acetonitrile and 0.1M Bu4NBr as supporting electrolyte was studied. The main gaseous products are CF₂CF₂, CH₂F₂ and CH₃F. Small amts. of CHClF₂ and CH₄ were also detected. Among the main products, CF₂CF₂ and CH₂F₂ are of great practical importance, because the 1st is the monomer for the production of Teflon and the 2nd is an excellent candidate for low temperature refrigeration applications, which in addition

does

not cause depletion of ozone. Silver is the most efficient electrode for the reduction of CFC-12, because the rate of the reduction was greater than at

the

other metals and the current efficiencies for CF₂CF₂ (38%) and CH₂F₂ (44%) were also high. Among the other electrodes, Pt gave also high current efficiencies but the reduction rate was much lower. The increase of the neg. potential at the Ag electrode leads to a significant increase in the rate of the electrochem. reduction. The electroredn. of CFC-12 was also studied in mixed acetonitrile + water solns. The exptl. results indicated an almost linear decrease of the reduction rate with the increase of the water content. This was attributed to the decreased solubility of CFC-12 in water. The formation rate of CF₂CF₂ was also significantly decreased.

IT 7440-02-0, Nickel, uses

RL: DEV (Device component use); PRP (Properties); USES (Uses)
(cathode for electrochem. reduction of dichlorodifluoromethane in acetonitrile medium)

IT 75-71-8, Dichlorodifluoromethane

RL: PEP (Physical, engineering or chemical process); PRP (Properties);
RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electrochem. reduction of dichlorodifluoromethane in acetonitrile and aqueous acetonitrile to useful fluorinated compds.)

IT 75-10-5P, Difluoromethane

RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(preparation in electrochem. reduction of dichlorodifluoromethane in acetonitrile medium)

REFERENCE COUNT: 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 14 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:339904 HCAPLUS

DOCUMENT NUMBER: 131:201498

TITLE: Conversion of CCl₂F₂ (CFC-12) in
the presence and absence of H₂ on sol-gel derived
Pd/Al₂O₃ catalysts

AUTHOR(S): Ocal, Meltem; Maciejewski, Marek; Baiker, Alfons
CORPORATE SOURCE: ETH-Zentrum, Laboratory of Technical Chemistry, Swiss
Federal Institute of Technology, Zurich, CH-8092,
Switz.

SOURCE: Applied Catalysis, B: Environmental (1999), 21(4),
279-289
CODEN: ACBEE3; ISSN: 0926-3373

PUBLISHER: Elsevier Science B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB Conversion of CCl₂F₂ in the presence (hydrogenolysis) and absence of hydrogen on Al₂O₃, AlF₃ and Pd/Al₂O₃ xerogel and aerogel catalysts showed formation of CClF₃ and CCl₃F on Al₂O₃ and AlF₃ in the presence and absence of hydrogen as well as on the Pd/Al₂O₃ catalysts in the absence of hydrogen. Overall activity increased during the hydrogenolysis reactions at 230° as a function of time which was paralleled by a significant increase in the yield of CClF₃ formed through a Cl/F-exchange reaction. X-ray diffraction patterns of the spent catalyst recovered after 3 h hydrogenolysis confirmed the presence of Pd(C) (Pd-carbon solid solution), and AlF₃ phases on Pd/Al₂O₃ catalysts indicated that the carbon incorporation into the Pd lattice and the transformation of Al₂O₃ to AlF₃ starts at the initial stage of the reaction. It was concluded that AlF₃ is responsible for the Cl/F-exchange reactions. CH₄, a complete hydrogenation product, is formed during hydrogenolysis. Another route for its formation is the reaction between hydrogen in the gas phase and the interstitial carbon.

IT 75-71-8, CFC 12

RL: RCT (Reactant); RACT (Reactant or reagent)
 (conversion of CCl₂F₂ in the presence and absence of H₂ on sol-gel derived Pd/Al₂O₃ catalysts)

IT 75-10-5P, Difluoromethane

RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of; conversion of CCl₂F₂ in the presence and absence of H₂ on sol-gel derived Pd/Al₂O₃ catalysts)

REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 15 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1998:708038 HCAPLUS

DOCUMENT NUMBER: 130:83159

TITLE: Selection of activated carbon for the selective hydrogenolysis of CCl₂F₂ (CFC-12) into CH₂F₂ (HFC-32) over palladium-supported catalysts

AUTHOR(S): van de Sandt, Emile J. A. X.; Wiersma, Andre; Makkee, Michiel; van Bekkum, Herman; Moulijn, Jacob A.

CORPORATE SOURCE: Department of Organic Chemistry and Catalysis, Delft University of Technology, Delft, 2628 BL, Neth.

SOURCE: Applied Catalysis, A: General (1998), 173(2), 161-173
 CODEN: ACAGE4; ISSN: 0926-860X

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Activated carbon was selected as support for Pd catalysts in the hydrogenolysis of CCl₂F₂ into CH₂F₂ because of its inertness to acid byproducts of the reaction. Various types of activated carbon were investigated. The catalysts have a selectivity of 65-85 mol% to CH₂F₂ at all conversion levels.

IT 75-10-5P, HFC-32

RL: IMF (Industrial manufacture); PREP (Preparation)
 (effect of activated C properties on selective hydrogenolysis of CCl₂F₂ to CH₂F₂ over Pd/C catalysts)

IT 75-71-8, CFC-12

RL: RCT (Reactant); RACT (Reactant or reagent)
 (effect of activated C properties on selective hydrogenolysis of CCl₂F₂ to CH₂F₂ over Pd/C catalysts)

REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 16 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1998:562991 HCAPLUS

DOCUMENT NUMBER: 129:218213

TITLE: Study of CrF₃/AlF₃ **catalyst** for synthesizing
HFC-134a as a substitute for **CFC-12**
. VI. Multifunctional **catalyst** for synthesis
of fluorohydrocarbons

AUTHOR(S): Lu, Jian; Shi, Lei; Wang, Zhenyu; Li, Huili; Peng,
Shaoyi

CORPORATE SOURCE: Xi'an Modern Chem. Inst., Xi'an, 710065, Peop. Rep.
China

SOURCE: Cuihua Xuebao (1998), 19(4), 375-377

CODEN: THHPD3; ISSN: 0253-9837

PUBLISHER: Kexue Chubanshe

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

AB γ -AlF₃-supported Cr³⁺ with other minor components (Co²⁺ and Mg²⁺)
catalyst exhibits higher activity, selectivity, and stability for
synthesis of HFC-134a, **HFC-32**, HCFC-123, HFC-152a and
C₆H₅CF₃ by gas-phase fluorination, and is an excellent catalyst for F/Cl
exchange reactions. The order of the activity of the catalyst for F/Cl
exchange reactions is as follows: HClCCH₂.apprx.Cl₂CCHCl>CH₂Cl₂.apprx.C₆H₅
CCl₃>CCl₂CCl₂>CF₃CH₂Cl.

IT 7784-18-1, Aluminum fluoride

RL: CAT (Catalyst use); USES (Uses)

(CrF₃/AlF₃ multifunctional **catalyst** for synthesis
fluorohydrocarbons as substitutes for **CFC-12** by
fluorination)

IT 75-10-5P, **HFC-32**

RL: MOA (Modifier or additive use); SPN (Synthetic preparation); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(CrF₃/AlF₃ multifunctional **catalyst** for synthesis
fluorohydrocarbons as substitutes for **CFC-12** by
fluorination)

L29 ANSWER 17 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1998:533789 HCAPLUS

DOCUMENT NUMBER: 129:303936

TITLE: Development of a satisfactory palladium on activated
carbon **catalyst** for the selective
hydrogenolysis of CCl₂F₂ (**CFC-12**)
into CH₂F₂ (**HFC-32**)

AUTHOR(S): Makkee, M.; van de Sandt, E. J. A. X.; Wiersma, A.;
Moulijn, J. A.

CORPORATE SOURCE: Section Industrial Catalysis, Department of Chemical
Process Technology, Delft University of Technology,
Delft, 2628 BL, Neth.

SOURCE: Journal of Molecular Catalysis A: Chemical (1998),
134(1-3), 191-200

CODEN: JMCCF2; ISSN: 1381-1169

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A Pd on activated C **catalyst** was developed for the selective
hydrogenolysis of waste CCl₂F₂ (**CFC-12**) to the high
value product, CH₂F₂ (**HFC-32**). The activity,
selectivity to CH₂F₂, and stability of the **catalyst** is a strong
function of the H/CFC ratio.

IT 75-10-5P, HFC-32
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (Pd/C catalyst for selective hydrogenolysis of waste
 CFC-12 to HFC-32)

IT 75-71-8, CFC-12
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (Pd/C catalyst for selective hydrogenolysis of waste
 CFC-12 to HFC-32)

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 18 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1998:463288 HCAPLUS

DOCUMENT NUMBER: 129:110399

TITLE: Comparison of the performance of activated
 carbon-supported noble metal catalysts in the
 hydrogenolysis of CCl₂F₂

AUTHOR(S): Wiersma, Andre; Van De Sandt, Emile J. A. X.; Den
 Hollander, Marion A.; Van Bekkum, Herman; Makkee,
 Michiel; Moulijn, Jacob A.

CORPORATE SOURCE: Industrial Catalysis Section, Department of Chemical
 Process Technology, Delft, 2628 BL, Neth.

SOURCE: Journal of Catalysis (1998), 177(1), 29-39
 CODEN: JCTLA5; ISSN: 0021-9517

PUBLISHER: Academic Press

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The hydrogenolysis of CCl₂F₂ over Pd, Pt, Rh, Ru, Ir and Re on activated C
 was studied in a micro-flow reactor at 450-540K, H₂/CCl₂F₂ feed ratio
 1.5-6, 0.4 MPa and WHSV 1 g/g.h. The main products of the reaction for
 all investigated catalysts were CHClF₂, CH₂F₂, and CH₄. According to
 their performance, the catalysts were divided into 4 groups: Re showing no
 conversion, Pd with high selectivity for CH₂F₂, Ir and Ru with high
 selectivity for CHClF₂, and Pt and Rh with moderate selectivity for CHClF₂
 and CH₂F₂. The adsorption of Cl on the metal surface plays an important
 role in the selectivity. Strong Cl adsorption leads to a higher
 selectivity for CHClF₂. These results are consistent with a reaction
 mechanism in which difluorocarbene is the key intermediate. Apparently,
 the same kinetic network applies to all metals studied. The performance
 of the catalysts changed as a function of time on stream. Pd, Rh, and
 especially Ru deactivated during the reaction, whereas the activity of Ir and

pt increased.

IT 75-71-8, Dichlorodifluoromethane
 RL: PEP (Physical, engineering or chemical process); RCT
 (Reactant); PROC (Process); RACT (Reactant or reagent)
 (activity and selectivity of activated carbon-supported noble metal
 catalysts in hydrogenolysis of CCl₂F₂)

IT 75-10-5P, Difluoromethane
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (activity and selectivity of activated carbon-supported noble metal
 catalysts in hydrogenolysis of CCl₂F₂ to)

REFERENCE COUNT: 46 THERE ARE 46 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 19 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1998:3020 HCAPLUS

DOCUMENT NUMBER: 128:26432

TITLE: Electrochemical Decomposition of CFC-12 using Gas
 Diffusion Electrodes

AUTHOR(S): Sonoyama, Noriyuki; Sakata, Tadayoshi
 CORPORATE SOURCE: Department of Electronic Chemistry Interdisciplinary
 Graduate School of Science and Engineering, Tokyo
 Institute of Technology, Yokohama, 226, Japan
 SOURCE: Environmental Science and Technology (1998), 32(3),
 375-378
 CODEN: ESTHAG; ISSN: 0013-936X
 PUBLISHER: American Chemical Society
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB Chlorofluorocarbons (CFCs) were known to cause the depletion of the ozone layer at the stratosphere. A large amount of CFCs is still in use as a refrigerant or still present in the plastic forms. These CFCs should be collected and retreated to harmless compds. to the environment. Electrochem. decomposition of dichlorodifluoromethane (CFC-12) was carried out using 12 kinds of metal supported gas diffusion electrodes (GDEs). Ag-, Cu-, In-, and Pb-supported GEDs showed high electrocatalytic activity of decomposition of CFC-12. Especially Cu-, In-, and Pb-supported GEDs showed almost

100% efficiency without producing the byproduct (H₂). Zn-, Ag-, Cu-, and In-supported GEDs caused defluorination of CFC-12 as well as dechlorination and produced methane mainly. Pb-supported GDE induced only dechlorination of CFC-12 and produced difluoromethane (HFC-32) in high selectivity (92.6%). With the increase in the c.d., the partial c.d. of methane formation at Cu-supported GDE was saturated at 370 mA cm⁻². The partial c.d. of HFC-32 formation at Pb-supported GDE was not saturated even at 650 mA cm⁻² and kept high selectivity of HFC-32 formation.

IT 75-71-8, CFC 12

RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent) (CFC-12; electrochem. decomposition of CFC-12 using gas diffusion electrodes)

IT 75-10-5, Difluoromethane

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative) (HFC-32; electrochem. decomposition of CFC-12 using gas diffusion electrodes)

IT 7440-02-0, Nickel, uses

RL: CAT (Catalyst use); USES (Uses) (electrochem. decomposition of CFC-12 using gas diffusion electrodes)

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 20 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1997:360426 HCAPLUS

DOCUMENT NUMBER: 127:96785

TITLE: Palladium black as model catalyst in the hydrogenolysis of CCl₂F₂ (CFC-12) into CH₂F₂ (HFC-32)

AUTHOR(S): van de Sandt, E. J. A. X.; Wiersma, A.; Makkee, M.; van Bekkum, H.; Moulijn, J. A.

CORPORATE SOURCE: Department of Organic Chemistry and Catalysis, Delft University of Technology, Julianalaan 136, BL Delft, 2628, Neth.

SOURCE: Applied Catalysis, A: General (1997), 155(1), 59-73
 CODEN: ACAGE4; ISSN: 0926-860X

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

LANGUAGE: English

- AB Palladium black is applied as a model catalyst for the hydrogenolysis of CCl_2F_2 into CH_2F_2 over carbon-supported palladium. The performance of palladium black is comparable with that of palladium on activated carbon. Fresh and used samples are characterized with x-ray diffraction (XRD), temperature programmed reduction (TPR), and temperature programmed oxidation (TPO) in a differential scanning calorimeter (DSC). Under reaction conditions, at temps. as low as 423K, palladium is converted into palladium carbide ($\text{PdC}_{0.15}$), indicating that the amount of carbon on the catalytic surface is negligible. Fluorine present has no catalytic effect. Methane treatment (>523K) and ethene treatment (>448K) also lead to the formation of palladium carbide. In those cases carbon is deposited on the surface of the palladium. The amount of hydrogen in fresh palladium, determined by measuring the temperature of decomposition of palladium hydride at different partial pressures of hydrogen and by measuring the heat of decomposition in DSC, is as $\text{PdH}_{0.6}$. This amount is in agreement with the value as obtained by TPR and as reported in literature.
- IT 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (activated, catalyst support; performance and characterization of palladium black model catalyst in hydrogenolysis of CFC 12 into HFC 32)
- IT 75-10-5P, HFC 32
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (performance and characterization of palladium black model catalyst in hydrogenolysis of CFC 12 into HFC 32)
- IT 75-71-8, CFC 12
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (performance and characterization of palladium black model catalyst in hydrogenolysis of CFC 12 into HFC 32)
- REFERENCE COUNT: 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT
- L29 ANSWER 21 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN
- ACCESSION NUMBER: 1997:35573 HCAPLUS
- DOCUMENT NUMBER: 126:76464
- TITLE: Mechanistic study of the selective hydrogenolysis of CCl_2F_2 (CFC-12) to CH_2F_2 (HCF-32) over palladium on activated carbon
- AUTHOR(S): van de Sandt, Emile J. A. X.; Wiersma, Andre; Makkee, Michiel; van Bekkum, Hermam; Moulijn, Jacob A.
- CORPORATE SOURCE: Dep. Org. Chem. Catalysis, Delft Univ. Technol., Delft, 2628, Neth.
- SOURCE: Recueil des Travaux Chimiques des Pays-Bas (1996), 115(11/12), 505-510
 CODEN: RTCPA3; ISSN: 0165-0513
- PUBLISHER: Elsevier
- DOCUMENT TYPE: Journal
- LANGUAGE: English
- AB The influence of temperature (400-560K), $\text{H}_2/\text{CCl}_2\text{F}_2$ ratio (2.2-20), and weight hourly space velocity (0.3-1.0 g/g.h) on the hydrogenolysis of CCl_2F_2 to CH_2F_2 over Pd/C was investigated. The catalyst shows a remarkably high selectivity to CH_2F_2 (70-90 mol%) at all conversion levels in a broad range of process conditions. A mechanism is proposed in which the reaction proceeds mainly via parallel reaction pathways. The postulated mechanism is supported by thermodyn. data.

IT 75-71-8, Dichlorodifluoromethane
 RL: PEP (Physical, engineering or chemical process); RCT
 (Reactant); PROC (Process); RACT (Reactant or reagent)
 (mechanism of selective hydrogenolysis of CCl₂F₂ to CH₂F₂ over Pd/C
 catalyst)
 IT 75-10-5P, Difluoromethane
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (mechanism of selective hydrogenolysis of CCl₂F₂ to CH₂F₂ over Pd/C
 catalyst)
 REFERENCE COUNT: 57 THERE ARE 57 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L29 ANSWER 22 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 1996:611391 HCAPLUS
 DOCUMENT NUMBER: 125:279125
 TITLE: Process development for the selective hydrogenolysis
 of CCl₂F₂ (CFC-12) into CH₂F₂ (HFC-
 32)
 AUTHOR(S): Wiersma, A.; Van de Sandt, E. J. A. X.; Makkee, M.;
 Van Bekkum, H.; Moulijn, J. A.
 CORPORATE SOURCE: Department Chemical Process Technology, Delft
 University Technology, Delft, 2628 BL, Neth.
 SOURCE: Studies in Surface Science and Catalysis (1996),
 101(Pt. A, 11th International Congress on
 Catalysis--40th Anniversary, 1996, Pt. A), 369-378
 CODEN: SSCTDM; ISSN: 0167-2991
 PUBLISHER: Elsevier
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB Pd on activated carbon is an efficient and stable catalyst for
 hydrogenolysis of CCl₂F₂ to CH₂F₂. The performance and stability of the
 catalyst strongly depend on the H₂ to CCl₂F₂ feed ratio. At low feed
 ratios coke deposition causes deactivation, but at high ratios sintering
 of Pd causes deactivation. The reaction follows parallel pathways. An
 ideal process for the hydrogenolysis includes a multi-tube fixed bed
 reactor with hydrogen recycle in which a limited amount of methane is
 allowed.

IT 75-71-8, Dichlorodifluoromethane
 RL: PEP (Physical, engineering or chemical process); RCT
 (Reactant); PROC (Process); RACT (Reactant or reagent)
 (process development for selective hydrogenolysis of CCl₂F₂ to CH₂F₂ in
 presence of palladium catalyst)
 IT 75-10-5P, Difluoromethane
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (process development for selective hydrogenolysis of CCl₂F₂ to CH₂F₂ in
 presence of palladium catalyst)

L29 ANSWER 23 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 1996:476634 HCAPLUS
 DOCUMENT NUMBER: 125:114156
 TITLE: Preparation of difluoromethane by reductive
 dechlorination
 INVENTOR(S): Wiersma, Andre; van de Sandt, Emilius Johannes
 Albertus Xaverius; van Bekkum, Herman; Makkee,
 Michiel; Moulijn, Jacob Adriaan
 PATENT ASSIGNEE(S): Technische Universiteit Delft, Neth.
 SOURCE: Neth. Appl., 12 pp.
 CODEN: NAXXAN
 DOCUMENT TYPE: Patent
 LANGUAGE: Dutch

FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
NL 9401574	A	19960501	NL 1994-1574	19940927
PRIORITY APPLN. INFO.:			NL 1994-1574	19940927

OTHER SOURCE(S): CASREACT 125:114156

AB CH₂F₂ was prepared by dehalogenation of CCl₂F₂ or CHClF₂ over a Pd-C catalyst containing 0.1-4.0% Pd on C with an ash content of 0.5-6%. Thus, CCl₂F₂ and H in 3:1 ratio were passed over a com. catalyst containing 0.5% pd on C with an ash content of 3.0% at 500 K to give CH₂F₂ with a selectivity of 87% at a conversion rate of 28%.

IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); PREP (Preparation)
(preparation of **difluoromethane** by reductive dechlorination over Pd catalyst)

IT 75-71-8, Dichlorodifluoromethane

RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of **difluoromethane** by reductive dechlorination over Pd catalyst)

L29 ANSWER 24 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1996:119245 HCAPLUS

DOCUMENT NUMBER: 124:180109

TITLE: Process for the selective hydrogenolysis of CCl₂F₂ (CFC-12) into CH₂F₂ (HFC-32)

AUTHOR(S): Wiersma, A.; van de Sandt, E. J. A. X.; Makkee, M.; Luteijn, C. P.; van Bekkum, H.; Moulijn, J. A.

CORPORATE SOURCE: Section Industrial Catalysis, Department of Chemical Process Technology, Delft University of Technology, Julianalaan 136, BL Delft, 2628, Neth.

SOURCE: Catalysis Today (1996), 27(1-2), 257-64

CODEN: CATTEA; ISSN: 0920-5861

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The conversion of waste CCl₂F₂ (CFC-12) into high added value product CH₂F₂ (HFC-32) seems tech. and economically feasible with a selected palladium on activated carbon **catalyst**. This **catalyst** shows a remarkable constant selectivity to HFC-32 in the range between 70% and 90% at all conversion levels with varying process conditions. Small amount of impurities, like Al, Fe or Cr, present in the activated carbon can have a significant effect on the **catalyst** performance. These impurities act as Friedel-Crafts **catalyst** thus catalyzing the unwanted chlorine-fluorine exchange. The chlorine-fluorine exchange can be sufficiently suppressed by removing the impurities from the activated carbon support prior to introduction of the palladium. The mechanism of the reaction follows mainly parallel rather than the expected serial pathways. A reaction scheme is proposed, which explains the high selectivity to HFC-32 by formation of a CF₂-carbene, which preferentially desorbs as HFC-32.

IT 7440-44-0, Activated carbon, uses

RL: CAT (Catalyst use); USES (Uses)
(activated; selective hydrogenolysis of CFC 12 into HFC 32 by using palladium on activated carbon **catalyst**)

IT 75-71-8, CFC-12

RL: RCT (Reactant); RACT (Reactant or reagent)

(selective hydrogenolysis of CFC 12 into
HFC 32 by using palladium on activated carbon
catalyst)

IT 75-10-5P, HFC-32

RL: SPN (Synthetic preparation); PREP (Preparation)

(selective hydrogenolysis of CFC 12 into
HFC 32 by using palladium on activated carbon
catalyst)

L29 ANSWER 25 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1995:994879 HCAPLUS

DOCUMENT NUMBER: 124:86351

TITLE: Process for converting chlorodifluoromethane and
dichlorodifluoromethane

INVENTOR(S): Manogue, William H.; Noelke, Charles J.; Swearingen,
Steven H.

PATENT ASSIGNEE(S): du Pont de Nemours, E. I., and Co., USA

SOURCE: PCT Int. Appl., 24 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9524369	A1	19950914	WO 1995-US1518	19950216
W: AM, AU, BB, BG, BR, BY, CA, CN, CZ, EE, FI, GE, HU, JP, KG, KP,				
KR, KZ, LK, LR, LT, LV, MD, MG, MN, MX, NO, NZ, PL, RO, RU, SI,				
SK, TJ, TT, UA, US, UZ, VN				
RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT,				
LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE,				
SN, TD, TG				
AU 9519122	A1	19950925	AU 1995-19122	19950216
US 5516947	A	19960514	US 1995-427637	19950421
PRIORITY APPLN. INFO.:			US 1994-212073	A 19940311
			WO 1995-US1518	W 19950216

AB A process is disclosed for the conversion of halogenated methanes of the formula: CClyH₂-yF₂ (wherein y is 1 or 2) to a mixture of conversion products. The process involves reacting certain halogenated hydrocarbon feeds and hydrogen (wherein said halogenated methanes are at least one mole percent of the halogenated hydrocarbon feed) in a reaction vessel of alumina, silicon carbide or at least one metal selected from gold, chromium, aluminum, molybdenum, titanium, nickel, iron, cobalt, and their alloys at a temperature of from about 500°C to 800°C and a pressure from about 101 kPa to 7000 kPa to produce a mixture of conversion products of said halogenated methanes which comprises at least 5 mol percent C₂H₂F₄, wherein the mole ratio of CH₂FCF₃ to CHF₂CHF₂ in said C₂H₂F₄ is at least about 1:9.

IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(process for converting chlorodifluoromethane and
dichlorodifluoromethane)

IT 1344-28-1, Alumina, uses 7429-90-5, Aluminum,
uses 7440-02-0, Nickel, uses

RL: NUU (Other use, unclassified); USES (Uses)

(process for converting chlorodifluoromethane and
dichlorodifluoromethane)

IT 75-71-8, CFC-12

RL: RCT (Reactant); RACT (Reactant or reagent)
(process for converting chlorodifluoromethane and
dichlorodifluoromethane)

L29 ANSWER 26 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1995:675633 HCAPLUS

DOCUMENT NUMBER: 123:338750

TITLE: Selective hydrogenation of CFC-12
to HFC-32 on Zr-Pd/C
catalyst

AUTHOR(S): Ohnishi, R.; Wang, W. -L.; Ichikawa, M.

CORPORATE SOURCE: Catalysis Research Center, Hokkaido University,
Sapporo, 060, Japan

SOURCE: Studies in Surface Science and Catalysis (1994),
90 (Acid-Base Catalysis II), 101-4
CODEN: SSCTDM; ISSN: 0167-2991

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 123:338750

AB A symposium. Reaction of dichlorodifluoromethane (CFC-12) and chlorodifluoromethane (HCFC-22) with H₂ was carried out on modified Pd catalysts. On 5wt% Pd/C, hydrogenation of CFC-12 gave mainly difluoromethane (HFC-32) at 200°C and methane at 350°C, resp. Zr and V modifiers promoted to increase in activity with no change in selectivity and, thus, to enhance the yield of HFC-32. From temperature programmed reduction (TPR) measurements, formation of Pd-Zr hydride, which desorbed hydrogen at ca. 200°C, was observed. This hydride may play a role to supply active hydrogen in the reaction at the reaction temperature

IT 75-10-5P, Difluoromethane

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(selective hydrogenation of CFC-12 to HFC-32 on Zr-Pd/C catalyst)

IT 75-71-8, CFC-12

RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(selective hydrogenation of CFC-12 to HFC-32 on Zr-Pd/C catalyst)

L29 ANSWER 27 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1995:667043 HCAPLUS

DOCUMENT NUMBER: 123:35762

TITLE: Effect of the Metal-Support Interaction on the Catalytic Properties of Palladium for the Conversion of Difluorodichloromethane with Hydrogen: Comparison of Oxides and Fluorides as Supports

AUTHOR(S): Coq, Bernard; Figueras, Francois; Hub, Serge; Tournigant, Didier

CORPORATE SOURCE: Laboratoire de Matériaux Catalytiques et Catalyse en Chimie Organique, ENSCM, Montpellier, 34053, Fr.

SOURCE: Journal of Physical Chemistry (1995), 99(28), 11159-66
CODEN: JPCHAX; ISSN: 0022-3654

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The reaction of CF₂Cl₂ with hydrogen has been studied between 433 and 523 K and atmospheric pressure, over Pd catalysts supported on graphite and oxides or

fluorides of Al, Ti, and Zr. In CF₂Cl₂ hydrogenation, CH₂F₂ and CH₄ represented >95% of the products. The catalytic properties of fluoride supported catalysts did not undergo any change as a function of time. In contrast, Pd supported on oxides showed changes in selectivity during the first hours on stream. This was ascribed to the reaction of the oxide support with HF released during the reaction. Alumina and titania were nearly completely converted to the corresponding fluorides, but not zirconia. The selectivity to the desired product CH₂F₂ was 56% for Pd/graphite and reached 90% for Pd/ZrF₄. The kinetic study suggested that the selectivity was controlled by the bond strength between a carbene-like species CF₂ and the surface. The strength of this interaction is supposed to vary with electron availability at the Pd surface, and this hypothesis was then investigated by IR spectroscopy using the adsorption of CO on Pd/Al₂O₃ and Pd/AlF₃. The morphol. of the Pd particles was little affected by the support and that AlF₃-supported Pd becomes electron deficient, due to the strong Lewis acidity of the support. This effect is mainly a short-range effect which is better induced by supports made up of a mixture of fluorides, oxyfluorides, and hydroxyfluorides, rather than pure fluorides. Catalytic properties similar to those of Pd/AlF₃ and ZrF₄ can be simulated with Pd/graphite samples promoted with small amts. of aluminum or zirconium.

- IT 13963-57-0, **Aluminum** acetylacetonate
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst precursor; metal-support interaction in
 difluorodichloromethane hydrogenation catalyzed by oxide or
 fluoride-supported palladium)
- IT 1344-28-1, **Aluminum** oxide, uses 7784-18-1,
Aluminum trifluoride 13463-67-7, **Titanium** oxide, uses
 RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
 (catalyst support; metal-support interaction in
 difluorodichloromethane hydrogenation catalyzed by oxide or
 fluoride-supported palladium)
- IT 75-10-5P, **Difluoromethane**
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (metal-support interaction in difluorodichloromethane hydrogenation
 catalyzed by oxide or fluoride-supported palladium)
- IT 75-71-8, **Difluorodichloromethane**
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (metal-support interaction in difluorodichloromethane
 hydrogenation catalyzed by oxide or fluoride-supported palladium)

L29 ANSWER 28 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 1994:533527 HCAPLUS
 DOCUMENT NUMBER: 121:133527
 TITLE: Process for producing **difluoromethane**
 INVENTOR(S): Ichikawa, Masaru; Ohnishi, Ryuichirou
 PATENT ASSIGNEE(S): Daikin, Industries, Ltd., Japan
 SOURCE: PCT Int. Appl., 14 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9411328	A1	19940526	WO 1993-JP1622	19931109
W: JP, US				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
EP 669304	A1	19950830	EP 1993-924196	19931109

EP 669304 B1 19980429
 R: DE, FR, GB, IT
 JP 3203655 B2 20010827 JP 1994-511920 19931109
 US 6700026 B1 20040302 US 1996-751557 19961118
 PRIORITY APPLN. INFO.: JP 1992-326103 A 19921111
 WO 1993-JP1622 W 19931109
 US 1995-433458 B1 19950608

OTHER SOURCE(S): CASREACT 121:133527

AB This patent application describes a process for producing difluoromethane (I) with high conversion and selectivity by the reaction of dichlorodifluoromethane (II) and/or monochlorodifluoromethane with hydrogen in the presence of a palladium-containing catalyst. Hydrogenation of II over a catalyst containing Pd and Zr on carbon under hydrogen at 250° gave I with 91% conversion of II, 81% selectivity for I, and 14% selectivity for methane.

IT 75-71-8, Dichlorodifluoromethane

RL: RCT (Reactant); RACT (Reactant or reagent)
 (hydrogenation of)

IT 75-10-5P, Difluoromethane

RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of, method for)

L29 ANSWER 29 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1994:298054 HCAPLUS

DOCUMENT NUMBER: 120:298054

TITLE: Preparation of hydrogen-containing fluoromethanes

INVENTOR(S): Yoshitake, Masaru; Tatematsu, Shin; Morikawa, Shinsuke

PATENT ASSIGNEE(S): Asahi Glass Co Ltd, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06001731	A2	19940111	JP 1992-183134	19920617
PRIORITY APPLN. INFO.:			JP 1992-183134	19920617

OTHER SOURCE(S): CASREACT 120:298054

AB The title compds. are prepared by H reduction of CCl₂F₂ in gas phases in presence of reduction catalysts and ≥1 compds. chosen from H-containing chlorofluorocarbons and H-containing fluorocarbons. CCl₂F₂, CHF₂CH₃, and H were passed through Pt/activated C at 250° with 60 s contact time to give CHClF₂ and CH₂F₂ with 51% and 20% selectivity, resp., at .apprx.80% conversion.

IT 75-10-5P, Difluoromethane

RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of, by reduction of dichlorodifluoromethane)

IT 75-71-8, Dichlorodifluoromethane

RL: RCT (Reactant); RACT (Reactant or reagent)
 (reduction of, hydrogen-containing fluoromethanes from)

L29 ANSWER 30 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1994:216700 HCAPLUS

DOCUMENT NUMBER: 120:216700

TITLE: Preparation of hydrogen-containing fluoromethanes

INVENTOR(S): Yoshitake, Masaru; Tatematsu, Shin; Morikawa, Shinsuke

PATENT ASSIGNEE(S): Asahi Glass Co Ltd, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 05339182	A2	19931221	JP 1992-179322	19920612
PRIORITY APPLN. INFO.:			JP 1992-179322	19920612
OTHER SOURCE(S):	CASREACT 120:216700			

AB H-containing fluoromethanes are prepared by H reduction of CCl₂F₂ in presence of

reduction catalysts comprising ≥ 1 main elements chosen from Group 8-10 elements and ≥ 1 addnl. elements chosen from Group 11 elements. PdCl₂ and HAuCl₄ were supported on C at 1.8 and 0.2 weight%, resp., reduced by hydrazine, and dried to prepare a catalyst. CCl₂F₂ was treated with H in presence of the catalyst at 250 ° for 60 s to give CHClF₂ and CH₂F₂ with 23 and 61% selectivity, resp., at .apprx.80% conversion.

IT 75-10-5P, Difluoromethane

RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of, by reduction of dichlorodifluoromethane)

IT 75-71-8, Dichlorodifluoromethane

RL: RCT (Reactant); RACT (Reactant or reagent)
 (reduction of, fluoromethanes from, catalysts for)

L29 ANSWER 31 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1993:494820 HCAPLUS

DOCUMENT NUMBER: 119:94820

TITLE: Conversion under hydrogen of
 dichlorodifluoromethane over supported
 palladium catalysts

AUTHOR(S): Coq, Bernard; Cognion, Jean Marie; Figueras, Francois;
 Tournigant, Didier

CORPORATE SOURCE: Lab. Chim. Org. Phys. Cinet. Chim. Appl., ENCSM,
 Montpellier, 34053, Fr.

SOURCE: Journal of Catalysis (1993), 141(1), 21-33
 CODEN: JCTLA5; ISSN: 0021-9517

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The conversion of difluorodichloromethane has been studied in the gas phase between 433 and 523 K at atmospheric pressure over Pd black and Pd supported on alumina, graphite, or AlF₃. CH₂F₂ and CH₄ represented more than 95% of the products. The catalytic properties of Pd/AlF₃ samples are unchanged with time, but Pd/graphite, Pd/Al₂O₃, and Pd black suffered changes of activity and/or selectivity during the first few hours on stream. This was ascribed to the diffusion of halide species into the bulk of palladium, and transformation of Al₂O₃ to AlF₃. At the steady state, the kinetics of CF₂Cl₂ hydrogenation can be described either by a halogenation/dehalogenation of the Pd surface by CF₂Cl₂ and H₂, resp., or by a classical Langmuir-Hinshelwood mechanism. At 453 K the interaction between the Pd surface and CF₂Cl₂ or H₂ is of the same order of magnitude. The CH₂F₂/CH₄ selectivity ratio was the lowest on Pd/graphite and the highest on Pd/AlF₃. It is proposed that adsorbed, or absorbed, halide species are responsible for the loss of CH₂F₂ selectivity. The high selectivity ratio on Pd/AlF₃ is ascribed to a cooperative effect between Pd and AlF₃.

IT 75-10-5P, Difluoromethane

RL: FORM (Formation, nonpreparative); PREP (Preparation)

(formation of, in hydrogenation of dichlorodifluoromethane)
IT 75-71-8, Dichlorodifluoromethane
RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrogenation of, over supported palladium catalysts)

L29 ANSWER 32 OF 32 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1991:641017 HCAPLUS

DOCUMENT NUMBER: 115:241017

TITLE: Process for converting spent butane isomerization catalyst to pentane isomerization catalyst

INVENTOR(S): Khara, Gyanesh P.

PATENT ASSIGNEE(S): Phillips Petroleum Co., USA

SOURCE: U.S., 5 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 5039639	A	19910813	US 1990-593457	19901005
PRIORITY APPLN. INFO.:			US 1990-593457	19901005
AB	A spent butane isomerization catalyst comprising Pt and Cl or Al ₂ O ₃ in an active pentane isomerization catalyst by a process comprising calcining and subsequent heating with a fluorocarbon and/or chlorofluorocarbon. The thus prepared catalyst can be used in the isomerization of pentane to isopentane.			
IT	75-10-5, Difluoromethane 75-71-8, Dichlorodifluoromethane			
	RL: RCT (Reactant); RACT (Reactant or reagent)			
	(in conversion of spent platinum-chlorine-alumina catalyst to butane isomerization catalyst)			

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